

# **CITY OF CARLSBAD ENGINEERING STANDARDS**

## **VOLUME 3 – STANDARD DRAWINGS AND NOTES**

### **CHAPTER 4 – POTABLE & RECYCLED WATER STANDARD DRAWINGS**

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##### **DWG NO.**



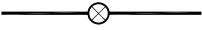
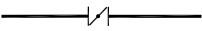
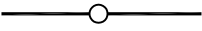



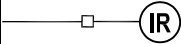
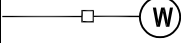
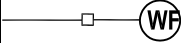



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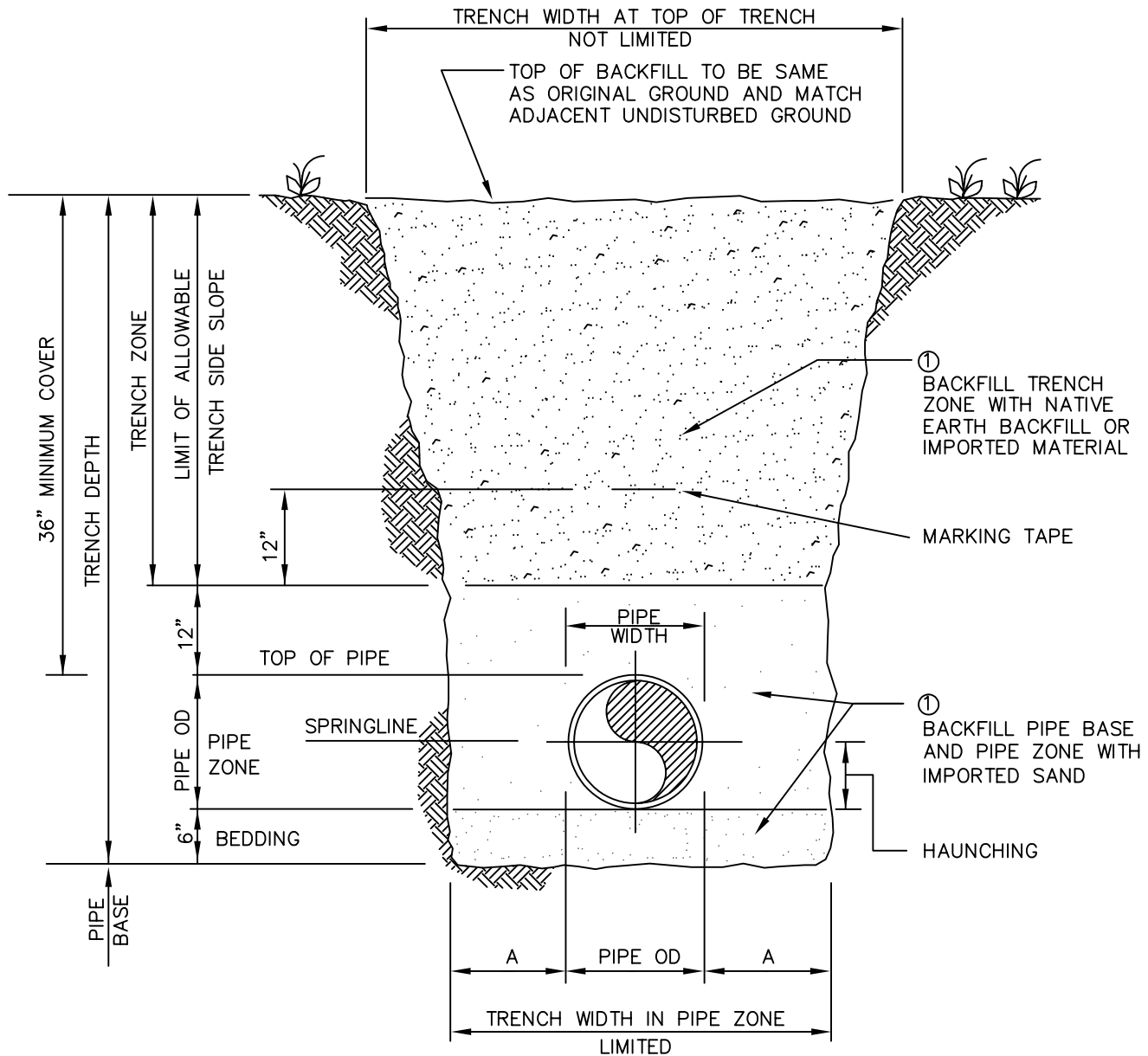
# **POTABLE AND RECYCLED WATER STANDARD DRAWINGS**

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<u>DESCRIPTION</u>	<u>ABREVIATION</u>	<u>C.M.W.D. DWG. NO.</u>	<u>SYMBOL</u>
WATER PIPELINE (Size Per Plan)	W	None	
RECYCLED WATER PIPELINE (Size Per Plan)	RW	None	
WATER GATE VALVE	GV	W16	
WATER BUTTERFLY VALVE	BFV	W17	
BLOW-OFF ASSEMBLY	BO	W6	
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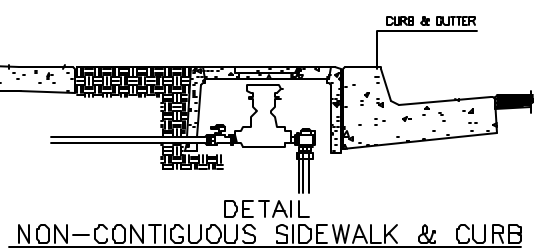
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	6-04
			STANDARD SYMBOLS FOR IMPROVEMENT PLANS	CITY ENGINEER
				DATE
				STANDARD DWG. NO. <b>W1</b>




A	PIPE DIAMETER	MIN.	MAX.
	1" THROUGH 8"	6"	9"
	10" THROUGH 16"	8"	12"
	18" THROUGH 24"	10"	18"
	27" THROUGH 36"	12"	24"

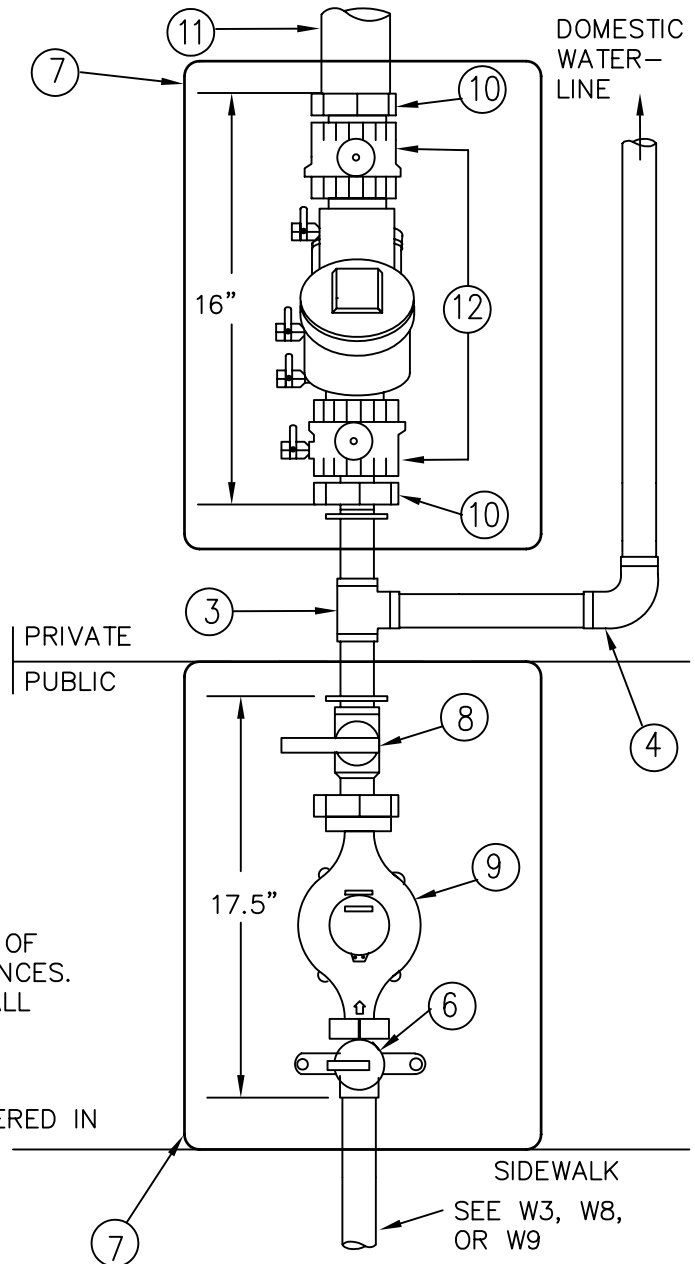
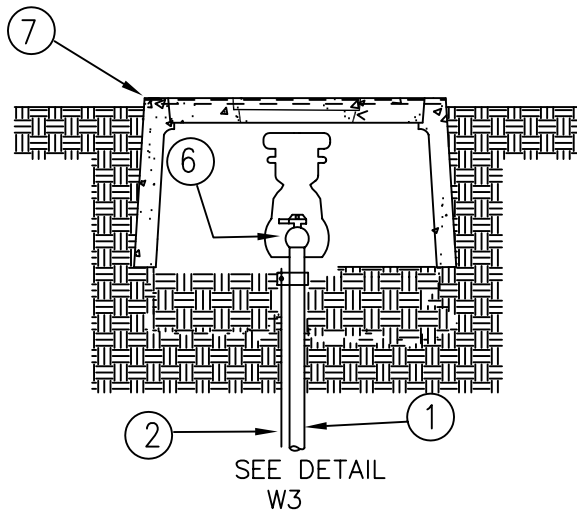
NO SCALE

ITEM		DESCRIPTION		SPEC/DWG	
1		BEDDING MATERIAL		SECT 02223	
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT		
			TYPICAL TRENCH SECTION		
			 6-04 CITY ENGINEER		DATE
			STANDARD DWG. NO.		W2



1. CONTRACTOR SHALL ADJUST ANGLE VALVE & METER BOX TO F.G. AFTER SIDEWALK IS INSTALLED & APPROVED
2. DISTRICT WILL SET METER AND BALL VALVE
3. ALL COPPER JIONTS SHALL BE SILVER SOLDERED IN CONFORMANCE WITH SPECIFICATIONS.
4. TAP TO MAIN TO BE MINIMUM OF 24" FROM NEAREST COUPLING, FITTING, VALVE, BELL OR OTHER TAPS.
5. POSITON ANODE MIDWAY BETWEEN PIPELINE AND METER BOX.
6. INTERIOR OF METER BOX SHALL BE CLEAR OF DEBRIS TO DEPTH OF 12" AND CORP STOP FULLY EXPOSED


REV.	APPROVED	DATE	<b>CARLSBAD MUNICIPAL WATER DISTRICT</b>  <b>1" WATER SERVICE CONNECTION</b>  <b>FOR 5/8", 3/4" &amp; 1" METERS</b>	 CITY ENGINEER	6-04 DATE
				STANDARD DWG. NO.	<b>W3</b>

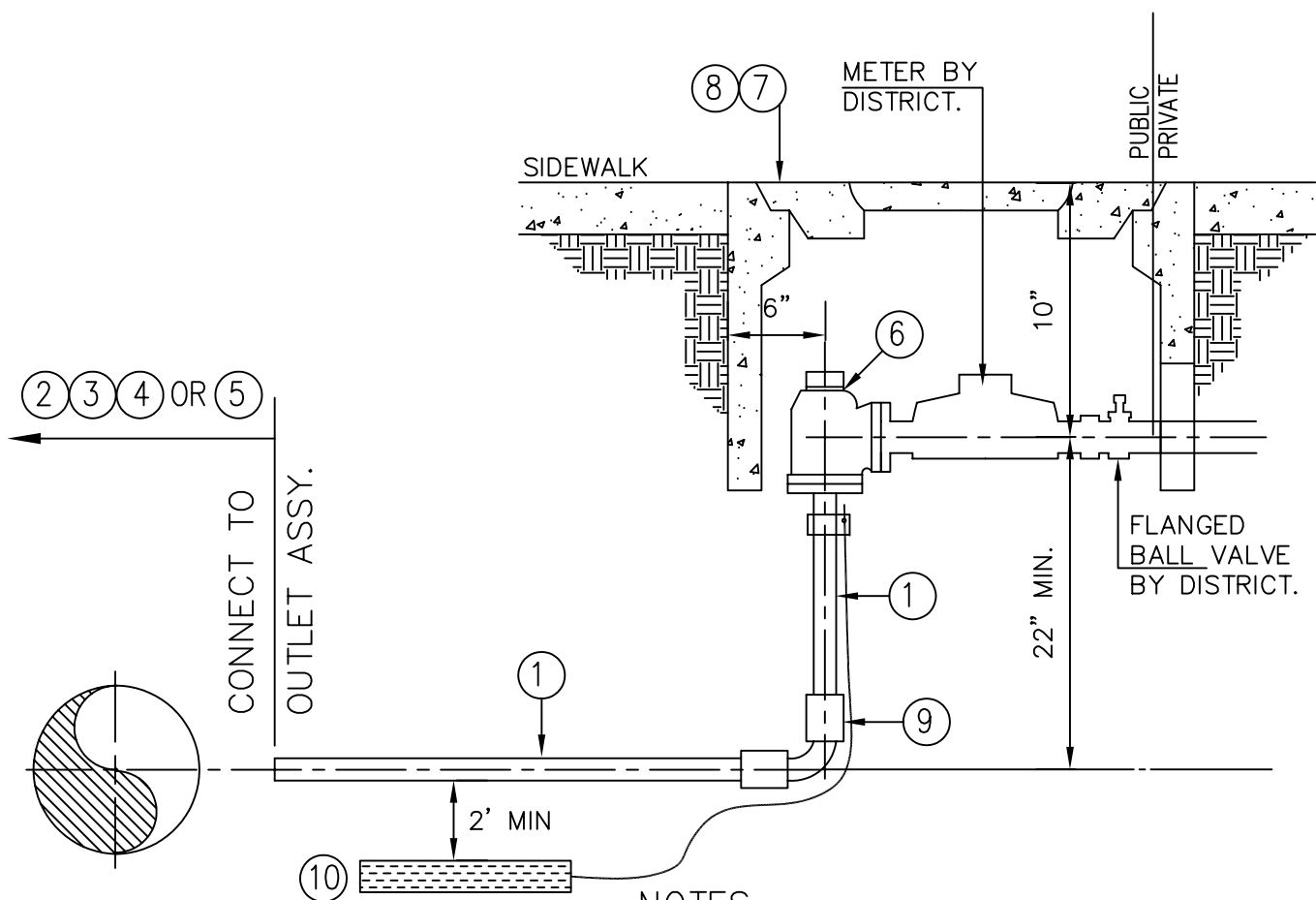


# NOTES:

1. REFER TO DRAWING W3 FOR SPECIFICATIONS OF INSTALLATION OF SERVICE LINE AND APPURTENANCES.
2. DISTRICT TO SET METER AND BALL VALVE, ALL OTHERS TO BE INSTALLED BY CONTRACTOR.
3. DOMESTIC WATER LINE MATERIAL WILL BE IN CONFORMANCE TO CODE.
4. ALL COPPER JOINTS SHALL BE SILVER SOLDERED IN CONFORMANCE WITH SPECIFICATIONS.

ITEM	DESCRIPTION	SPEC/DWG
1	COPPER, [TYPE 'K', SOFT]	
2	30 LB. ZINC ANODE LEAD WIRE	
3	1" COPPER TEE (SILVER SOLDER)	
4	1" 90° COPPER BEND (SILVER SOLDER)	
5	NOT USED	
6	1" ANGLE METER STOP	
7	#37 ARMORCAST METER BOX (OR EQUIVALENT)	
8	1" BALL VALVE	
9	1" WATER METER BY DISTRICT	
10	BRASS UNION	
11	2" FIRE SYSTEM WATER LINE	
12	1" DOUBLE CHECK VALVE WITH SHUT OFF VALVES	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			1" DOMESTIC WATER SERVICE CONNECTION WITH FIRE SPRINKLER SYSTEM 3/4" METERS	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>W3-A</b>

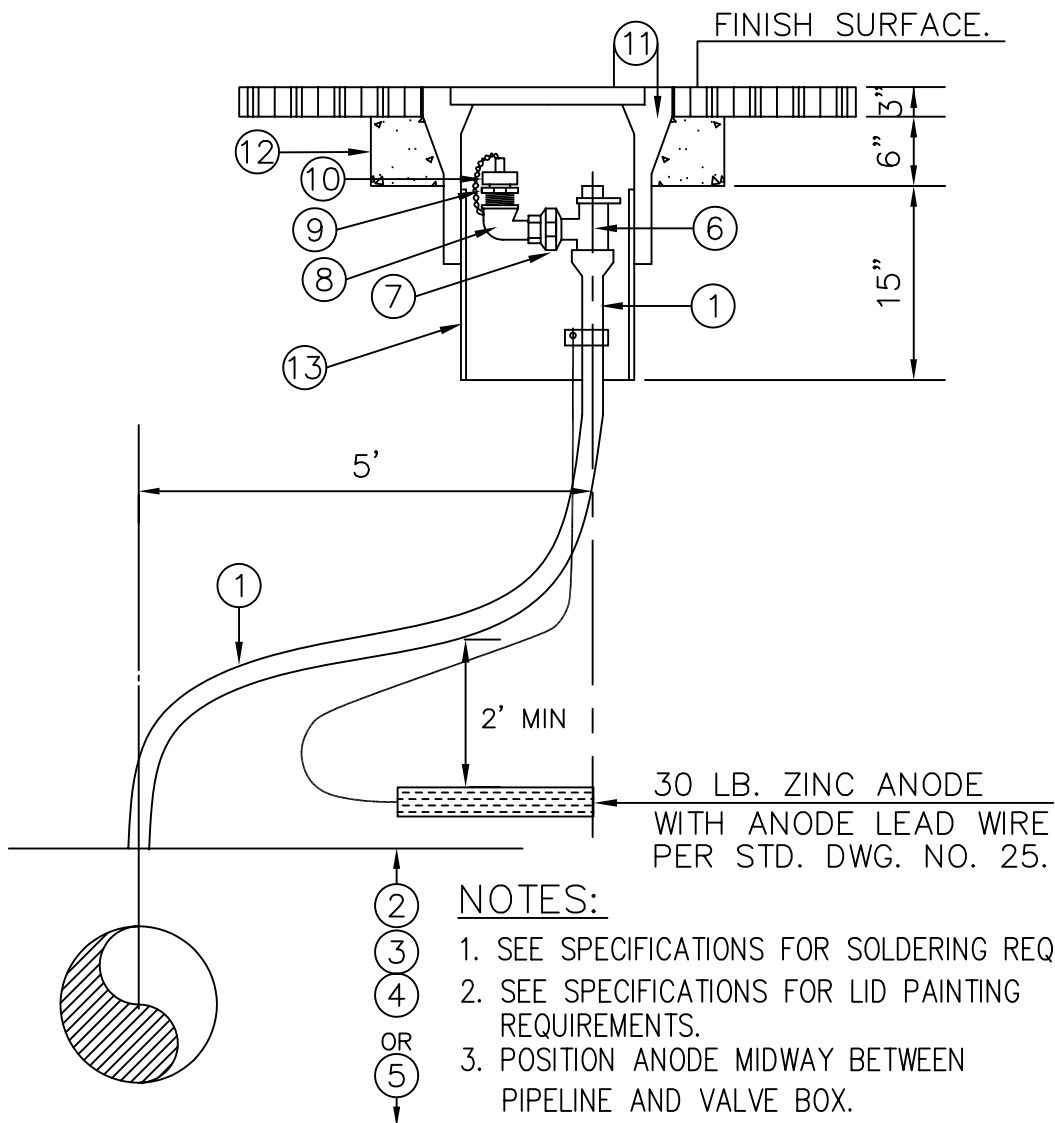


### NOTES:

1. DISTRICT WILL SET METER AND BALL VALVE
2. ALL COPPER JIONTS SHALL BE SILVER SOLDERED IN CONFORMANCE WITH SPECIFICATIONS.
3. TAP TO MAIN TO BE MINIMUM OF 18" FROM NEAREST COUPLING OF TAP.
4. POSITION ANODE MIDWAY BETWEEN PIPELINE AND METER BOX.
5. FOR NON-CONTIGUOUS SIDEWALK SEE DETAIL DRAWING W3.

ITEM	DESCRIPTION	SPEC/DWG
1	2" COPPER SERVICE PIPE	
2	OUTLET ON PVC PRESSURE PIPE	8
3	OUTLET ON ACP PIPE	8
4	OUTLET ON CML&C STEEL PIPE	9
5	OUTLET ON DUCTILE IRON PIPE	9
6	2" ANGLE METER STOP	
7	METER BOX AND COVER (TRAFFIC AREA)	
8	METER BOX AND COVER (NON-TRAFFIC AREA)	
9	2" C X C 90° ELL (SILVER SOLDERED).	
10	30 LB. ZINC ANODE WITH ANODE LEAD WIRE	25

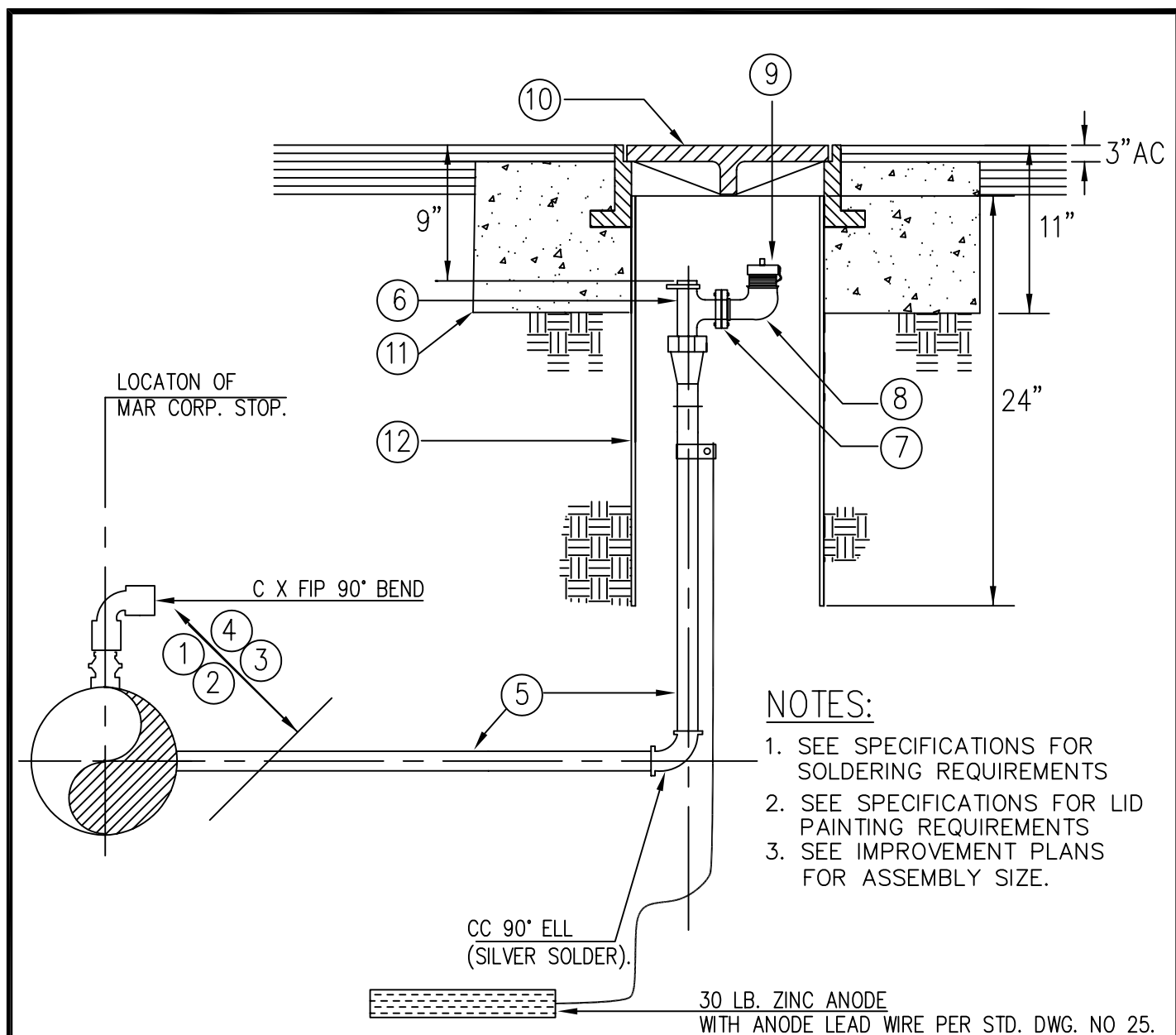
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Primm</i> 6-04
			2" WATER SERVICE CONNECTION	CITY ENGINEER DATE
			FOR 1 1/2" & 2" METERS	STANDARD DWG. NO. W4



ITEM	DESCRIPTION	SPEC/DWG
1	1" TYPE "K" SOFT COPPER	
2	OUTLET ON PVC PRESSURE PIPE.	8
3	OUTLET ON AC PIPE.	8
4	OUTLET ON CML&C STEEL PIPE.	9
5	OUTLET ON DUCTILE IRON PIPE.	9
6	1" ANGLE METER STOP	
7	1 1/4" X 1" BRASS BUSHING.	
8	1" BRASS STREET ELL.	
9	1" ADAPTER M.I.P. X N.S.HT	
10	HOSE THREAD CAP	
11	VALVE BOX/LID	13
12	CONCRETE COLLAR	
13	8" PVC, C900	

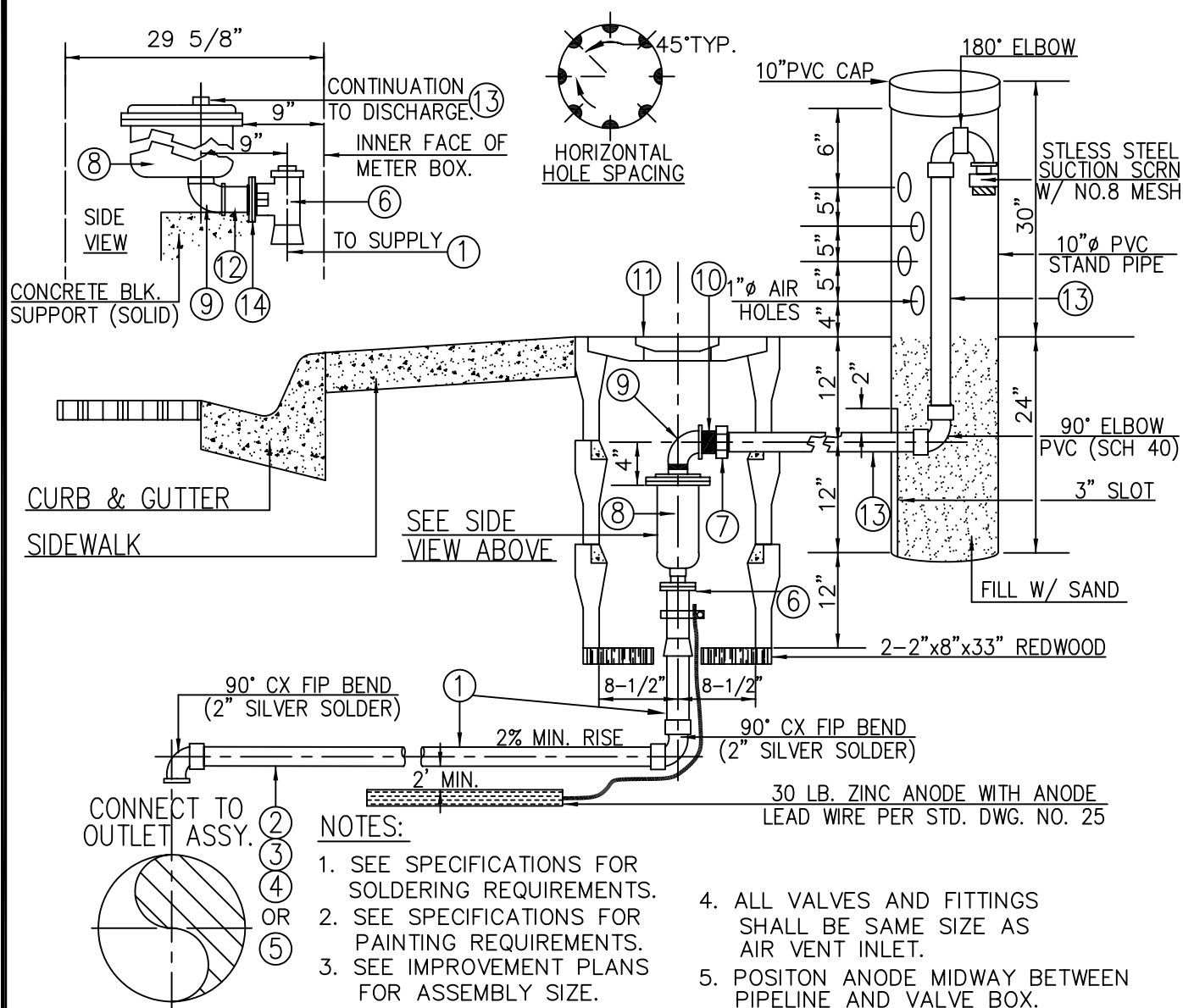
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Pearson</i> 6-04
			1" MANUAL AIR RELEASE ASSEMBLY	CITY ENGINEER DATE
				STANDARD DWG. NO. W5



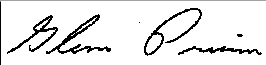


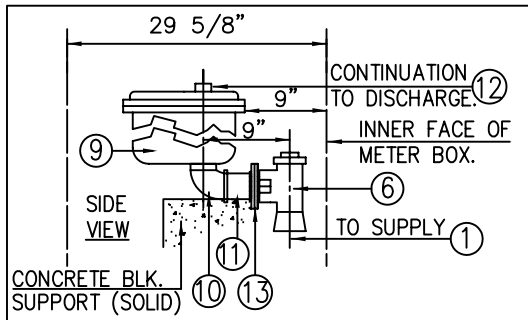
ITEM	DESCRIPTION	SPEC/DWG
1	OUTLET ON PVC PRESURE PIPE	8
2	OUTLET ON AC PIPE	8
3	OUTLET ON CML&C STEEL PIPE	9
4	OUTLET ON DUCTILE IRON PIPE	9
5	2" COPPER SERVICE PIPE. (TYPE 'K' SOFT).	
6	2" ANGLE METER STOP	
7	2" METER COMPANION FLANGE. (BRASS NUTS AND BOLTS).	
8	2" BRASS STREET ELL	
9	ADAPTER-2" M.I.P. X 2 1/2" NSHT W/ 2 1/2" CAP	
10	12" DIA. C.I. VALVE BOX COVER MARKED WATER OR RECYCLED WATER	
11	30" DIAMETER X 8" THICK CONCRETE RING	
12	12" GRAVITY SEWER PIPE SDR 35	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			2" BLOW-OFF / MANUAL AIR RELEASE ASSEMBLIES	 CITY ENGINEER DATE STANDARD DWG. NO. <b>W6</b>

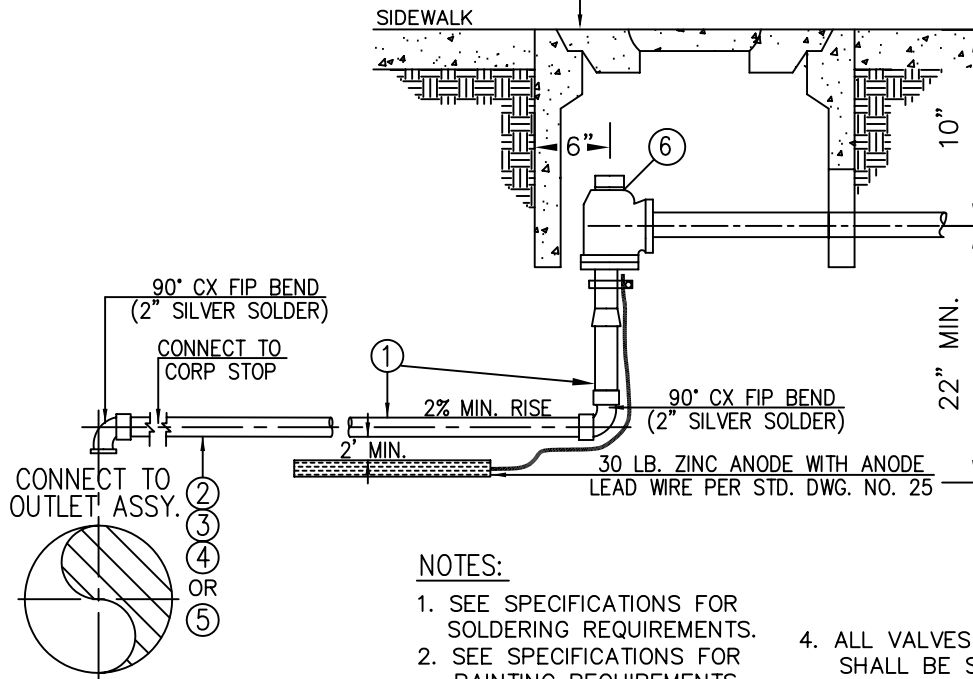
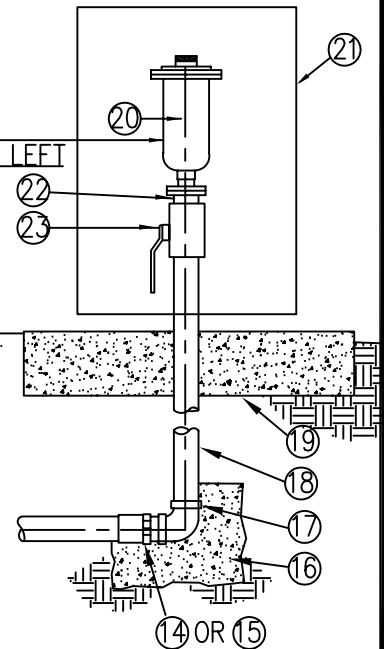


ITEM	DESCRIPTION	SPEC/DWG
1	1" COPPER, (TYPE 'K', SOFT), 2" COPPER SERVICE PIPE. (TYPE "K" SOFT).	
2	OUTLET ON PVC PRESSURE PIPE	8
3	OUTLET ON AC PIPE	8
4	OUTLET ON CML&C STEEL PIPE	9
5	OUTLET ON DUCTILE IRON PIPE	9
6	1" OR 2" ANGLE METER STOP	
7	1" OR 2" BRASS UNION.	
8	1" OR 2" HEAVY DUTY COMBINATION AIR RELEASE.	
9	1" OR 2" BRASS STREET "L"	
10	1" OR 2" X CL. BRASS NIPPLE.	
11	METER BOX - STACK 3	
12	1" OR 2" X 6" BRASS NIPPLE	
13	1" OR 2" SCHEDULE 40 PVC	
14	BRASS METER COMPANION FLANGE. (BRASS NUTS AND BOLTS ON 2")	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			BELOW SURFACE 1 & 2" AIR-VACUUM VALVE ASSEMBLY & APPURTENANCE	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>W7</b>



SEE SIDE VIEW TO THE LEFT



#### NOTES:

1. SEE SPECIFICATIONS FOR SOLDERING REQUIREMENTS.
2. SEE SPECIFICATIONS FOR PAINTING REQUIREMENTS.
3. SEE IMPROVEMENT PLANS FOR ASSEMBLY SIZE.
4. ALL VALVES AND FITTINGS SHALL BE SAME SIZE AS AIR VENT INLET.
5. POSITION ANODE MIDWAY BETWEEN PIPELINE AND VALVE BOX.

ITEM	DESCRIPTION	SPEC/DWG	ITEM	DESCRIPTION	SPEC/DWG
1	1" COPPER, (TYPE 'K', SOFT), 2" COPPER SER. PIPE. (TYPE "K" SOFT)		14	2" COPPER ADAPTER, COPPER SOLDER JOINT x MALE IPT, 0-300 PSI	
2	OUTLET ON PVC PRESSURE PIPE	8	15	2" FLARED TUBE STR CPLG, COPPER x MALE IPT, 0-150 PSI	
3	OUTLET ON AC PIPE	8	16	CONCRETE ANCHOR BLOCK WITH 2 CUBIC FEET	
4	OUTLET ON CML&C STEEL PIPE	9	17	2" CL 125 CAST BRONZE 90° ELBOW WITH FEMALE IPT	
5	OUTLET ON DUCTILE IRON PIPE	9	18	2" BRASS PIPE, REGULAR WALL WITH MALE IPT	
6	1" OR 2" ANGLE METER STOP		19	30"x30"x6" CONCRETE PAD	
7	METER BOX & COVER (TRAFFIC AREA)		20	2" COMB. AIR RELEASE AND VACUUM VALVE, FEMALE IPT	
8	METER BOX & COVER (NONTRAFFIC AREA)		21	AIR VALVE ENCLOSURE FOR 2-INCH CAV ASSEMBLY	
9	1" OR 2" HEAVY DUTY COMBINATION AIR RELEASE.		22	1" OR 2" METER STOP	
10	1" OR 2" BRASS STREET "L"		23	2" BRONZE BALL VALVE	
11	1" OR 2" X 6" BRASS NIPPLE				
12	1" OR 2" SCHEDULE 40 PVC				
13	BRASS METER COMPANION FLANGE. (BRASS NUTS AND BOLTS ON 2")				

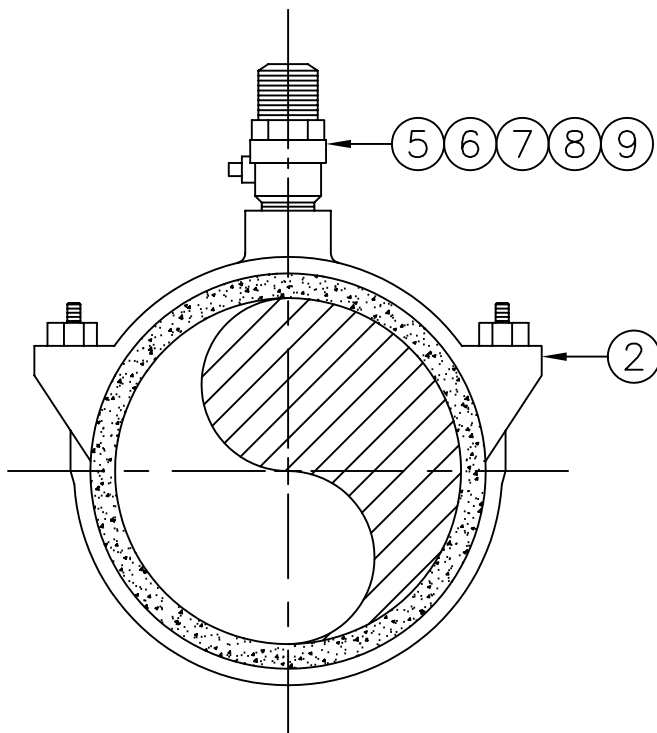
REV. APPROVED DATE CARLSBAD MUNICIPAL WATER DISTRICT

ABOVE SURFACE 1 & 2" AIR-VACUUM VALVE  
ASSEMBLY & APPURTENANCE

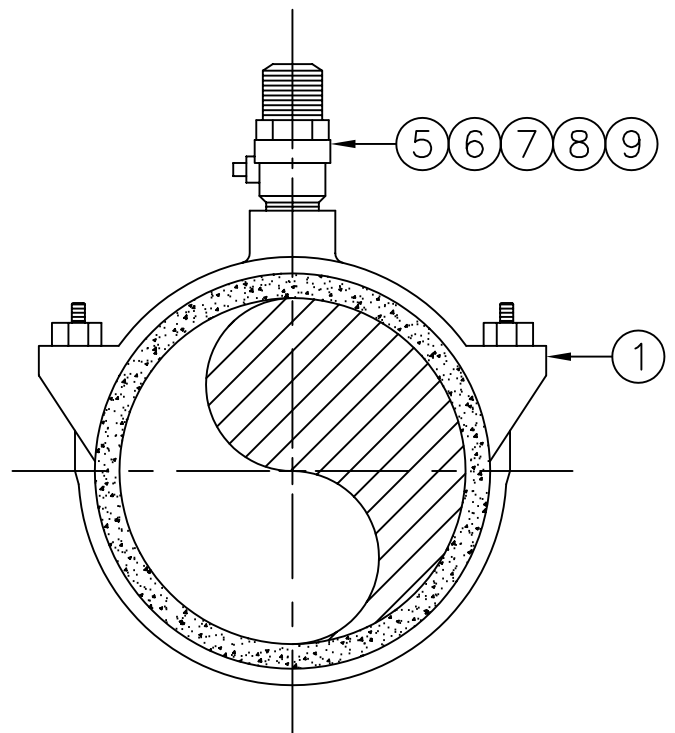
*Glenn Pearson* 6-04

CITY ENGINEER DATE

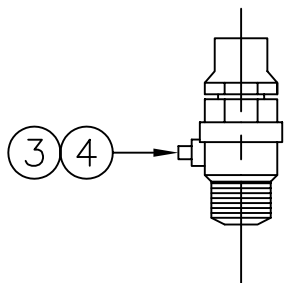
STANDARD DWG. NO. **W7-A**



A.C. MAIN



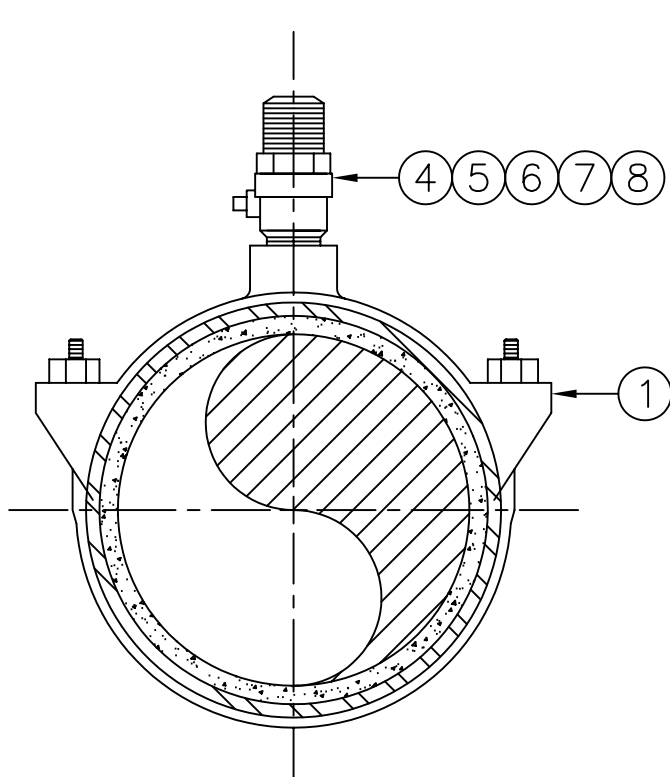
P.V.C. MAIN



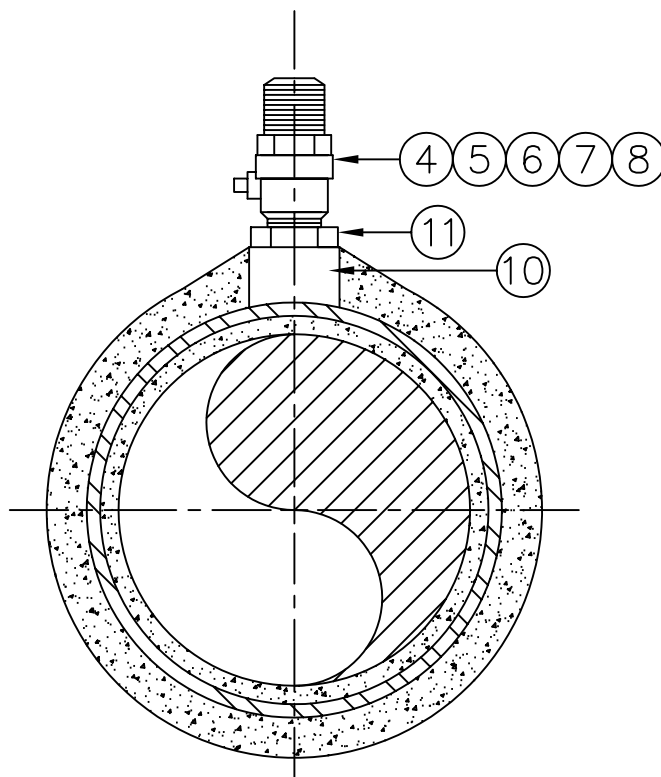
FOR WATER SERVICE  
CONNECTION ( TYP. )

ITEM	DESCRIPTION	SPEC/DWG
1	DOUBLE BAND BRASS SERVICE SADDLE.	
2	BRONZE DOUBLE STRAP SERVICE SADDLE.	
3	CORP. STOP 1" WATER SERVICE.	3
4	CORP. STOP 2" WATER SERVICE.	4
5	CORP. STOP 1" AIR VACUUM VALVE ASSEMBLY.	7
6	CORP. STOP 2" AIR VACUUM VALVE ASSEMBLY	7
7	1" MANUAL AIR RELEASE ASSEMBLY	5
8	2" BLOW-OFF MANUAL AIR RELEASE ASSEMBLY.	5&6
9	2" MANUAL BLOW-OFF / AIR RELEASE ASSEMBLY.	6&7

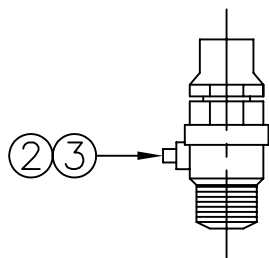
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			OUTLETS ON A.C. OR P.V.C. MAIN FOR 1 INCH THRU 2 INCH ASSEMBLIES	<i>Glenn Pearson</i> 6-04
				CITY ENGINEER DATE
				STANDARD DWG. NO. <b>W8</b>



D.I. MAIN



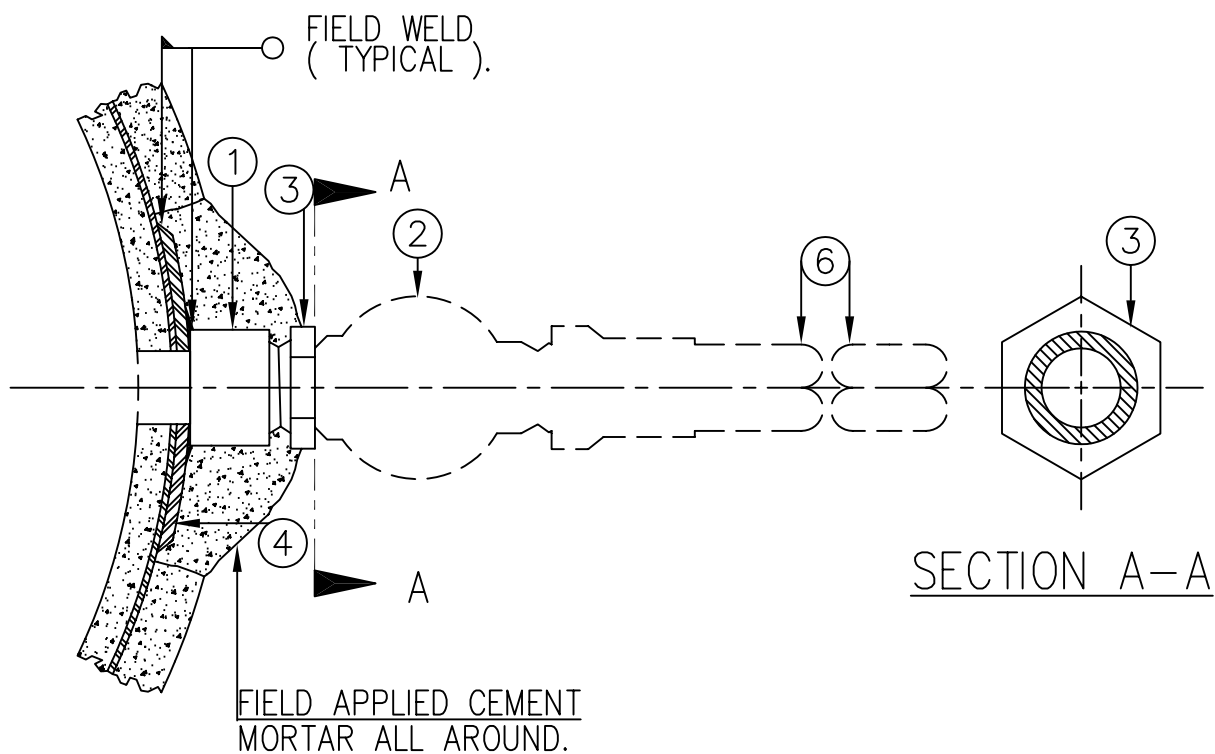
STEEL MAIN



FOR WATER SERVICE  
CONNECTION ( TYP. )

ITEM	DESCRIPTION	SPEC/DWG
1	DOUBLE BAND BRASS SERVICE SADDLE.	
2	CORP. STOP 1" WATER SERVICE.	3
3	CORP. STOP 2" WATER SERVICE.	4
4	CORP. STOP 1" AIR VACUUM VALVE ASSEMBLY.	7
5	CORP. STOP 2" AIR VACUUM VALVE ASSEMBLY.	7
6	1" MANUAL AIR RELEASE ASSEMBLY.	5
7	2" BLOW-OFF MANUAL AIR RELEASE ASSEMBLY.	6&7
8	2" BLOW-OFF / AIR RELEASE ASSEMBLY.	6&7
9	NOT USED	
10	3000 PSI FORGED STEEL COUPLING WELDED TO MAIN.	10
11	INSULATING BUSHING. ( LEXAN OR DELRIN ).	10

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			OUTLETS ON D.I. OR STEEL MAIN FOR 1 INCH THRU 2 INCH ASSEMBLIES	 CITY ENGINEER STANDARD DWG. NO.
				6-04 DATE <b>W9</b>



#### NOTES:

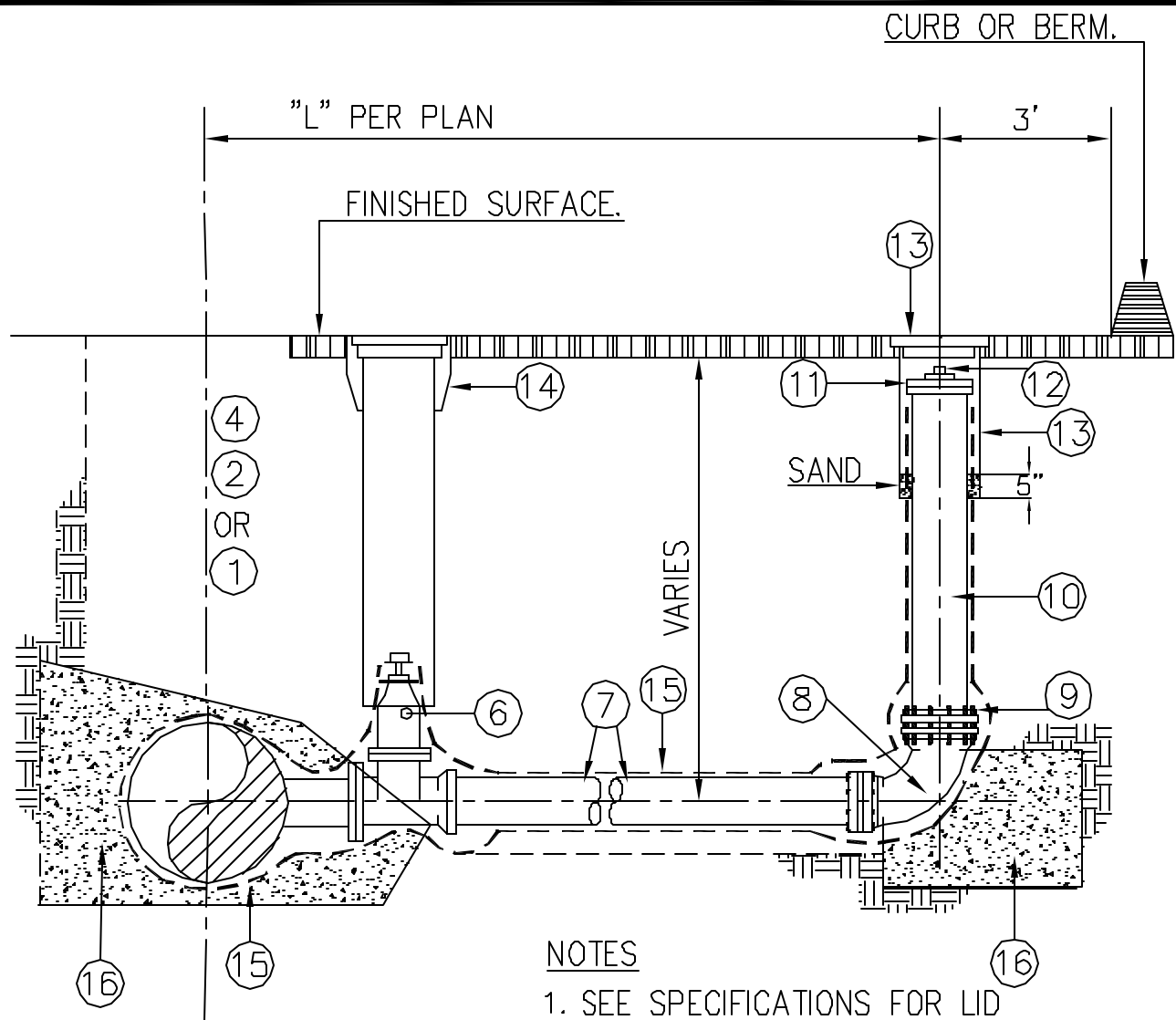
1. DIELECTRIC CONNECTIONS SHALL BE REQUIRED ON ALL AIR AND VACUUM VALVE ASSEMBLIES, MANUAL AIR RELEASE ASSEMBLIES, BLOW-OFF ASSEMBLIES AND WATER SERVICE ASSEMBLIES WHERE COPPER TUBING OR BRASS PIPE CONNECTIONS ARE MADE TO STEEL MAINS.

#### SIZING TABLE

COPPER TUBING	VALVE OR CORP.STOP	STEEL COUPLING	INSULATING BUSHING
2"	2"	2 1/2"	2 1/2" x 2"
1"	1"	1 1/2"	1 1/2" x 1"

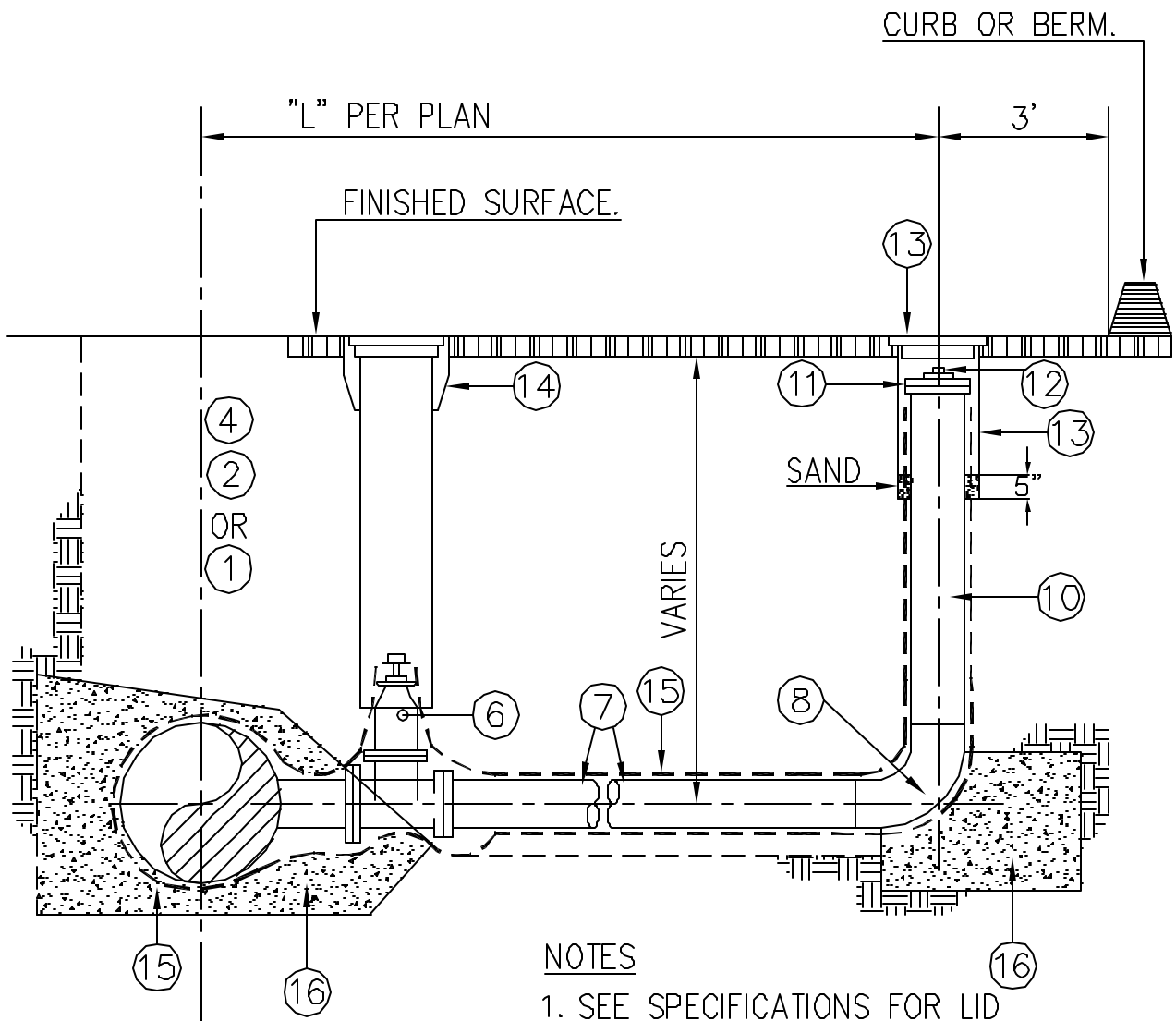
ITEM	DESCRIPTION	SPEC/DWG
1	CL 3000 STEEL COUPLING - STEEL WELDED.	
2	SEE DRAWING NO W9	W9
3	INSULATING BUSHING - NPT LEXAN OR DELRIN.	
4	9" DIA. 10 GA. SADDLE.	
5	NOT USED	
6	1" & 2" COPPER SERVICE PIPE ( TYPE "K" SOFT ).	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			DIELECTRIC CONNECTION	<i>Glen P. ...</i> 6-04
			TO STEEL MAIN	CITY ENGINEER DATE
				STANDARD DWG. NO. W10



ITEM	DESCRIPTION	SPEC./DWG
1	A.C.P. - RT X FL TEE.	
2	STEEL PIPE - FL TAPPED CONNECTION.	
3	NOT USED	
4	D.I.P. - MJ X FL TEE. ( FL. BOSS OUTLET ALTERNATE / DELETE THRUST BLOCK ).	
5	NOT USED	
6	FL X PJ GATE VALVE.	
7	PE CL. 50 D.I.P.	
8	MJ 90° BEND.	
9	RETAINER GLAND.	
10	FL X PE CL. 50 D.I.P.	
11	COMPANION FLANGE CONCENTRICALLY DRILLED AND TAPPED FOR ITEM 12.	
12	THREADED PLUG, OR STL. NIPPLE, FEMALE HOSE NIPPLE & HOSE CAP.	
13	12" VAL. BOX MKD. "WATER" OR "RECYCLED WATER"	W6
14	VALVE BOX ASSEMBLY. REFER TO STD DWG W13	
15	POLYETHYLENE WRAP.	
16	CONCRETE THRUST BLOCK 560-C-3250.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Steve P. ...</i>	6-04
			6" BLOW-OFF ASSEMBLY	CITY ENGINEER	DATE
			(DUCTILE IRON)	STANDARD DWG. NO.	WII



ITEM	DESCRIPTION	SPEC/DWG
1	A.C.P. - RT X FL TEE.	
2	STEEL PIPE - FL TAPPED CONNECTION.	
3	NOT USED	
4	D.I.P. - MJ X FL TEE. ( FL. BOSS OUTLET ALTERNATE / DELETE THRUST BLOCK ).	
5	NOT USED	
6	FL X FL GATE VALVE.	
7	CML & C 0.25" STEEL	
8	WELD ON PREFABRICATED CML & C STEEL / 90° BEND	
9	NOT USED	
10	FL X PE CML&C STL/SOWO FL	
11	COMPANION FLANGE DRILLED AND TAPPED FOR ITEM 12.	
12	THREADED PLUG, OR STL NIPPLE, FEMALE HOSE NIPPLE & HOSE CAP.	
13	12" VAL. BOX MKD. "WATER" OR "RECYCLED WATER"	W6
14	VALVE BOX ASSEMBLY. REFER TO STD DWG W13	
15	POLYETHYLENE WRAP.	
16	CONCRETE THRUST BLOCK 560-C-3250.	

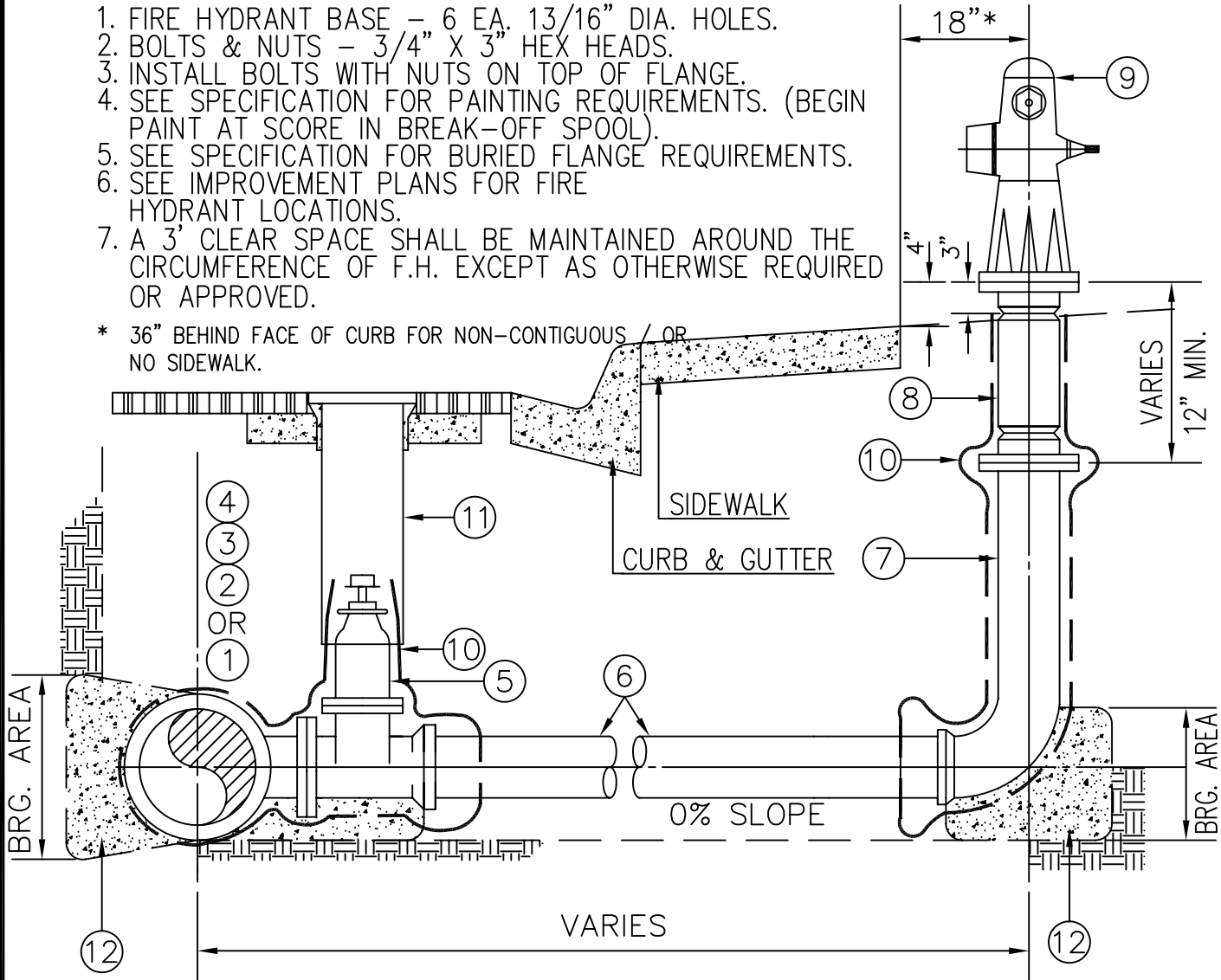
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Blair P. ...</i> 6-04
			6" BLOW-OFF ASSEMBLY (STEEL)	CITY ENGINEER DATE
				STANDARD DWG. NO. <b>W11-A</b>



# NOTES:

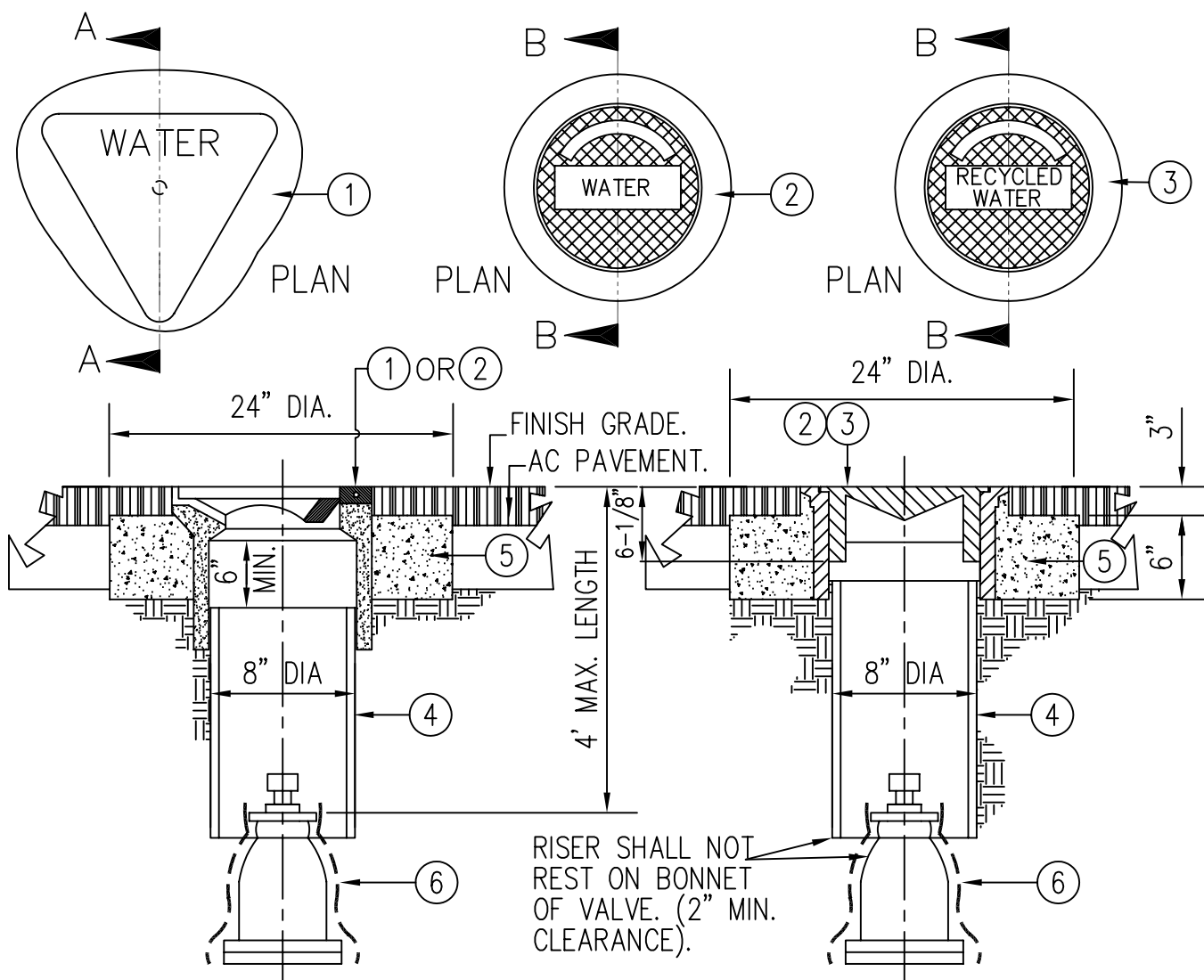
1. FIRE HYDRANT BASE - 6 EA. 13/16" DIA. HOLES.
2. BOLTS & NUTS - 3/4" X 3" HEX HEADS.
3. INSTALL BOLTS WITH NUTS ON TOP OF FLANGE.
4. SEE SPECIFICATION FOR PAINTING REQUIREMENTS. (BEGIN PAINT AT SCORE IN BREAK-OFF SPOOL).
5. SEE SPECIFICATION FOR BURIED FLANGE REQUIREMENTS.
6. SEE IMPROVEMENT PLANS FOR FIRE HYDRANT LOCATIONS.
7. A 3' CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF F.H. EXCEPT AS OTHERWISE REQUIRED OR APPROVED.

\* 36" BEHIND FACE OF CURB FOR NON-CONTIGUOUS / OR NO SIDEWALK.



ITEM	DESCRIPTION	SPEC/DWG
1	A.C.P. - RT X FL TEE.	
2	DUCTILE IRON PIPE - D.I. TEE WITH 6" FL. OUTLET. ( PJ OR MJ X FL )	
3	STEEL PIPE - 6" STEEL FL OUTLET.	
4	ASBESTOS CEMENT PIPE - RT X FL TEE WITH 6" OUTLET.	
5	6" FL X PJ GATE VALVE.	
6	6" CLASS 150 PVC PRESSURE PIPE.	
7	6" X 30" PJ X FL BURYELL. ( 6 HOLE PATTERN ).	
8	6" VARIABLE LENGTH FL. BREAK OFF SPOOL. ( GROOVED BOTH ENDS ).	
9	6" FIRE HYDRANT.	
10	POLYETHYLENE WRAP.	
11	VALVE BOX ASSEMBLY.	
12	THRUST BLOCK	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Pearson</i> 6-04
			FIRE HYDRANT ASSEMBLY	CITY ENGINEER
				DATE
				STANDARD DWG. NO. W12




SECTION A-A  
DOMESTIC WATER

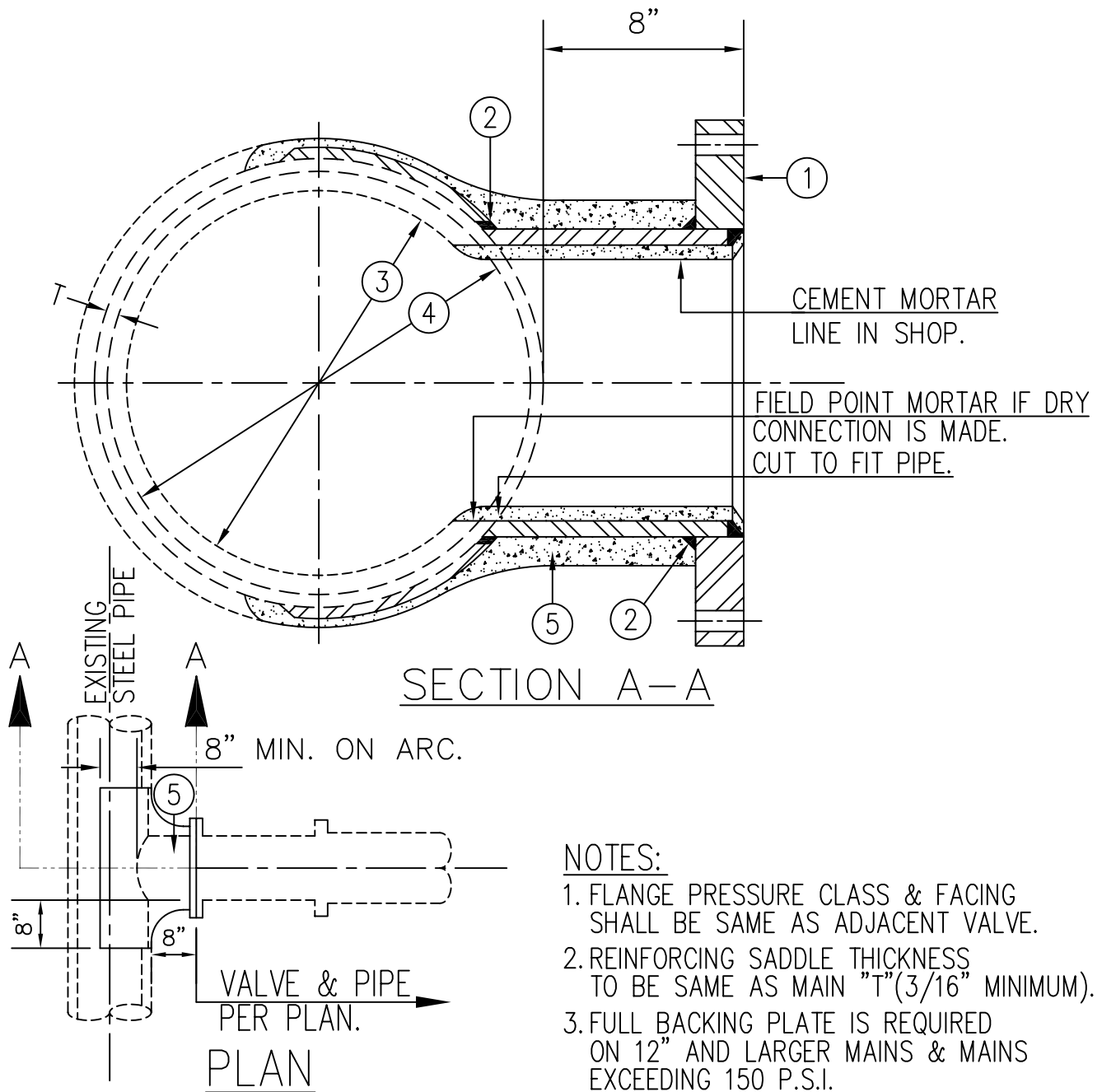
SECTION B-B  
RECLAIMED WATER

NOTES:

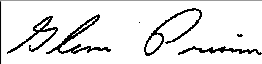
1. IN NON-ROAD AREAS PLACE MARKER POST NEXT TO VALVE BOX ASSEMBLY AS DIRECTED BY THE ENGINEER. ( SEE DRAWING NO. 23 ).
2. SEE DRAWING NO. 23 FOR GATE VALVE EXTENSION.
3. UPPER SIDE OF LID TO RECEIVE 2 COATS OF PAINT. SEE SPECIFICATIONS FOR PAINTING REQUIREMENTS, ( PAGE 4 ).

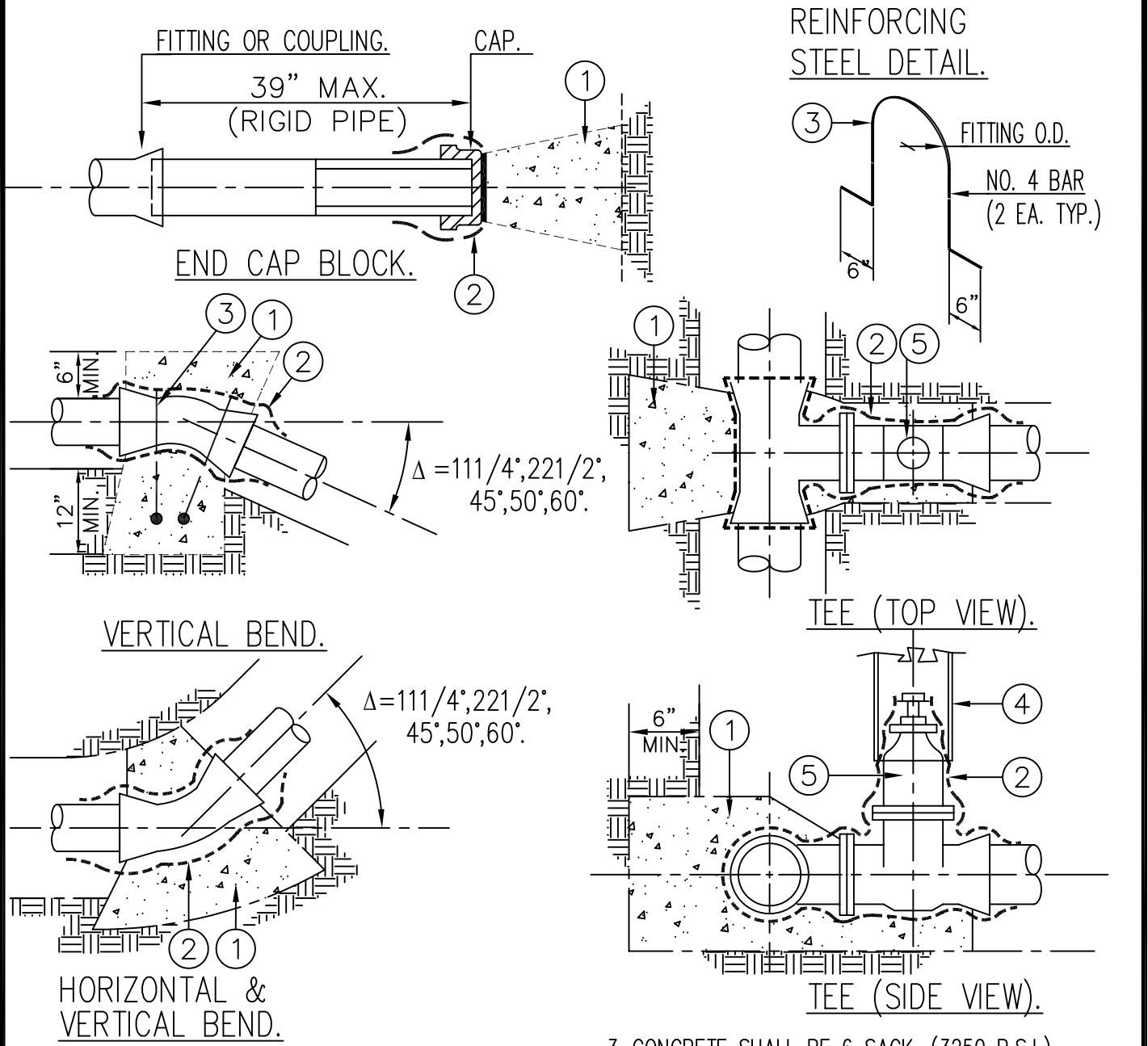
ITEM	DESCRIPTION	SPEC/DWG
1	VAL. BOX & COVER WITH NON-SKID C.I. COVER AND LIFT HOLE, MARKED "WATER".	
2	VAL. BOX & COVER FOR NORMALLY CLOSED VALVE.	
3	VAL. BOX & COVER MARKED "RECYCLED WATER".	
4	8" C900 PVC OR ASPHALT COATED WELL CASING.	
5	CONCRETE COLLAR IDENTIFY CONC. BY CLASS 560-C-3250	
6	POLYETHYLENE WRAP	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			VALVE BOX ASSEMBLY	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>WI3</b>



ITEM	DESCRIPTION	SPEC/DWG
1	S.O.W.O. FLANGE.	
2	FIELD WELD ( TYPICAL ).	
3	EXISTING STEEL PIPE.	
4	EXISTING STEEL PIPE I.D.	
5	3/4" MIN. CEMENT MORTAR COAT IN FIELD.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			TAPPED CONNECTION TO STEEL MAIN	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>WI4</b>

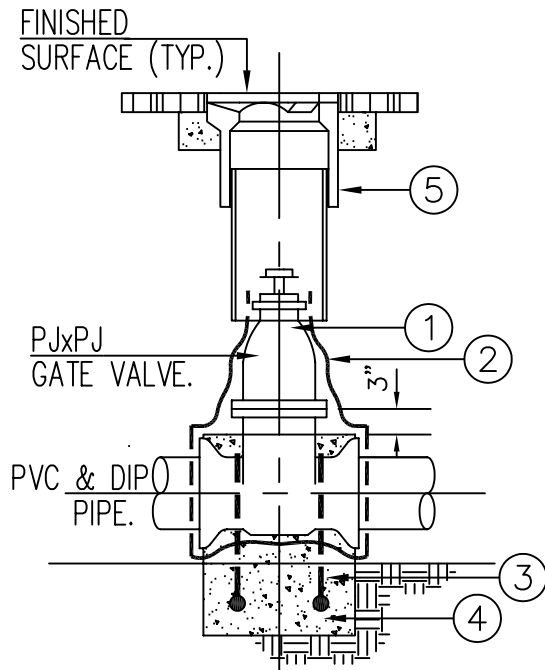


**NOTES:**

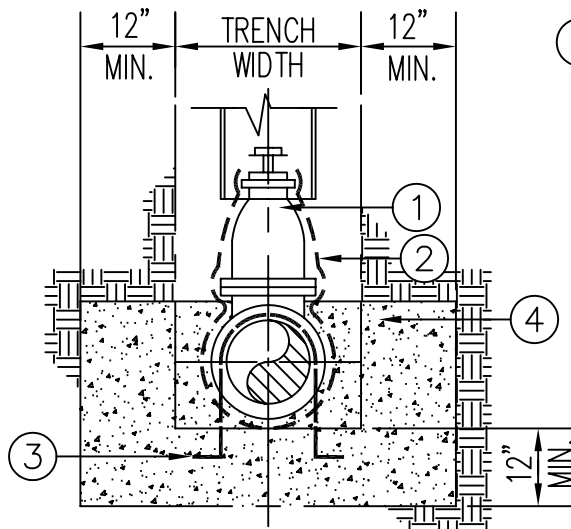
1. FITTINGS SHALL BE DUCTILE IRON FOR D.I.P. & P.V.C.; CAST IRON FOR A.C.P. (CEMENT LINED SHORT BODY).
2. FOR A.C. PIPE, A MIN. 3'-3" TO A 6'-6" MAX. LENGTH INTO AND OUT OF ALL FITTINGS.
3. CONCRETE SHALL BE 6 SACK, (3250 P.S.I.). A MIN. 3 DAY CURING TIME BEFORE HYDROSTATIC TEST.
4. SEE DWG'S. NO. 17 & 18 FOR REDUCER, PLUG, & BUTTERFLY VALVE THRUST BLOCKS.
5. ENGINEER TO PROVIDE CALCULATIONS FOR THRUST/ANCHOR BLOCK SIZE.

ITEM	DESCRIPTION	SPEC/DWG
1	CONCRETE THRUST BLOCK. (560-C-3250)	
2	POLYETHYLENE WRAP.	
3	NO. 4 REINFORCING STEEL.	
4	VALVE BOX ASSEMBLY.	
5	FL X RT OR FL X MJ GATE VALVE.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	 CITY ENGINEER STANDARD DWG. NO. <b>W15</b>
			CONCRETE THRUST BLOCKS	
			FOR NON-RESTRAINED JOINTS	



TRENCH ELEVATION  
PVC PIPE

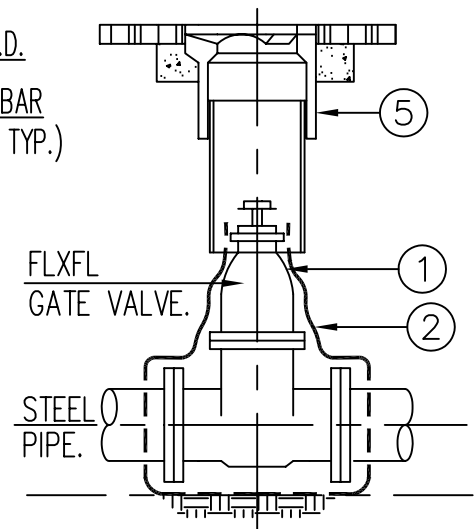
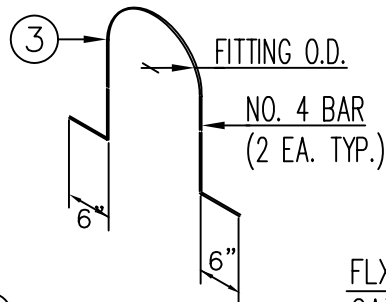


TRENCH SECTION  
(TYPICAL)

NOTES:


1. SEE SPECIFICATIONS FOR BURIED FLANGE AND VALVE REQUIREMENTS.
2. SEE DRAWING NO.19 FOR THRUST BLOCK BEARING AREAS.

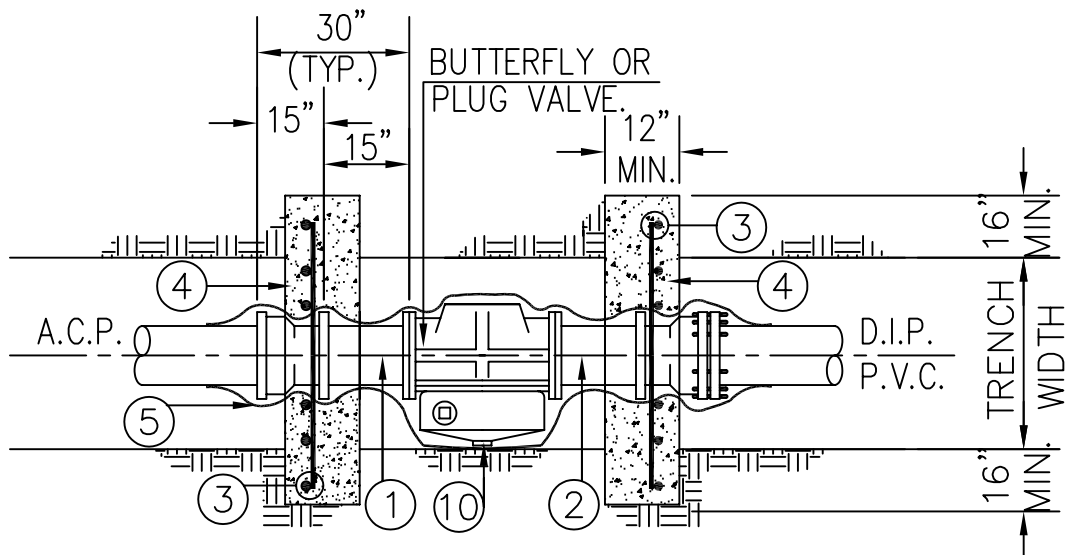
REINFORCING  
STEEL DETAIL.



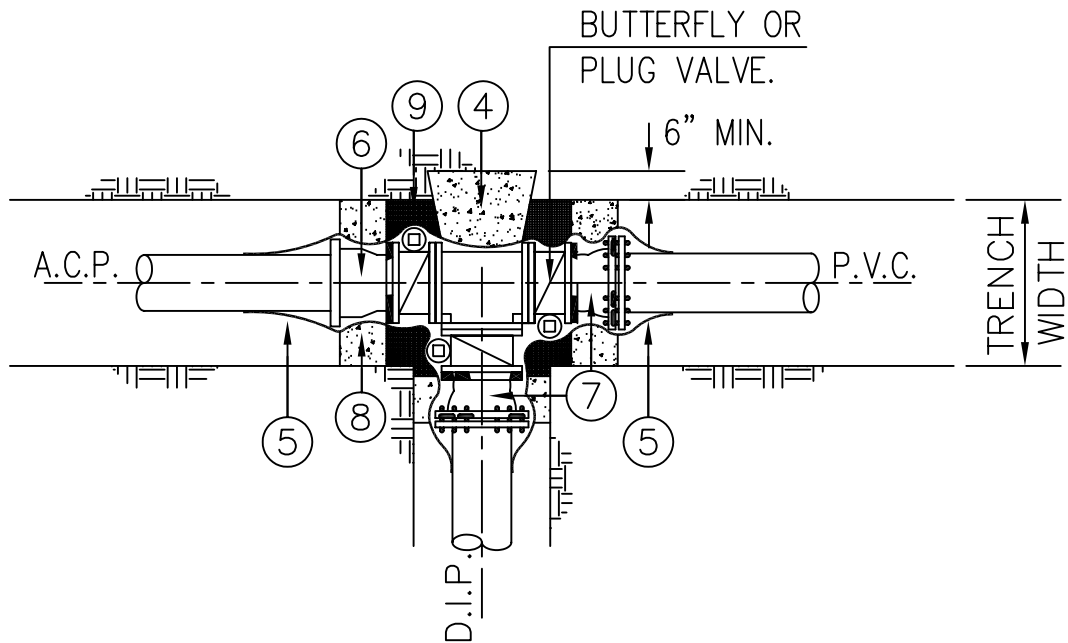
TRENCH ELEVATION  
STEEL PIPE

ITEM	DESCRIPTION	SPEC/DWG
1	GATE VALVE	
2	POLYETHYLENE WRAP.	
3	NO. 4 REINFORCING STEEL.	
4	CONCRETE THRUST/ANCHOR BLOCK. (3250 P.S.I.) 560-C-3250	19
5	VALVE BOX ASSEMBLY.	13

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			GATE VALVE INSTALLATION P.V.C., D.I.P., & STEEL PIPE.	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>WI6</b>



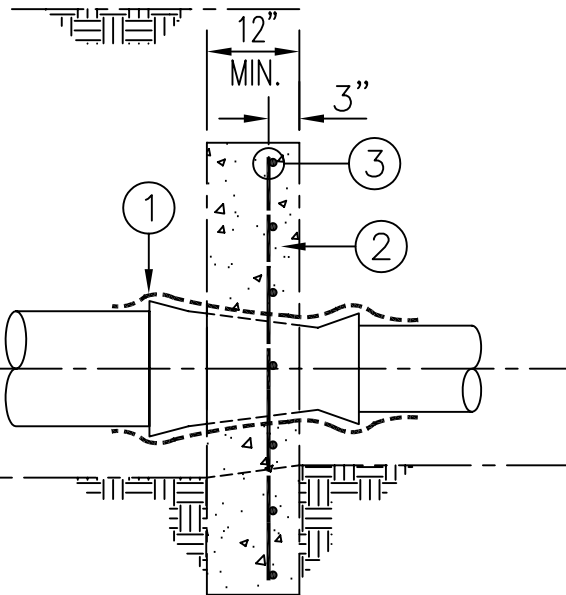
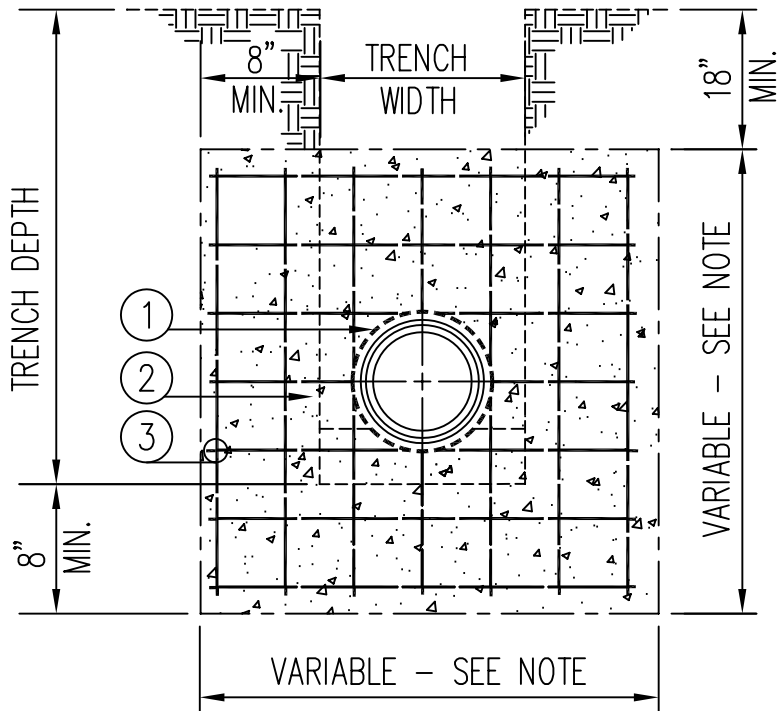
LINE VALVE INSTALLATION



TEE ASSEMBLY

ITEM	DESCRIPTION	SPEC/DWG
1	FOR A.C.P. — 30" LONG FL X RT WALL PIPE.	
2	FOR P.V.C. & D.I.P. — 30" LONG FL X MJ WALL PIPE.	
3	NO. 4 REINFORCING STEEL 6" O.C. EACH WAY.	
4	CONCRETE THRUST BLOCK. (3250 P.S.I.) 560-C-3250	19
5	POLYETHYLENE WRAP.	
6	FOR A.C.P. — FL X RT ADAPTER.	
7	FOR P.V.C. & D.I.P. — FL X MJ OR PJ ADAPTER.	
8	CONCRETE SUPPORT.	
9	SANDBAGS.	
10	BUTTERFLY OR PLUG VALVE	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	CITY ENGINEER	DATE
			BUTTERFLY & PLUG VALVE	<i>Blum P. P.</i>	6-04
			INSTALLATION FOR A.C., P.V.C. & D.I.P.		
				STANDARD DWG. NO.	WI7



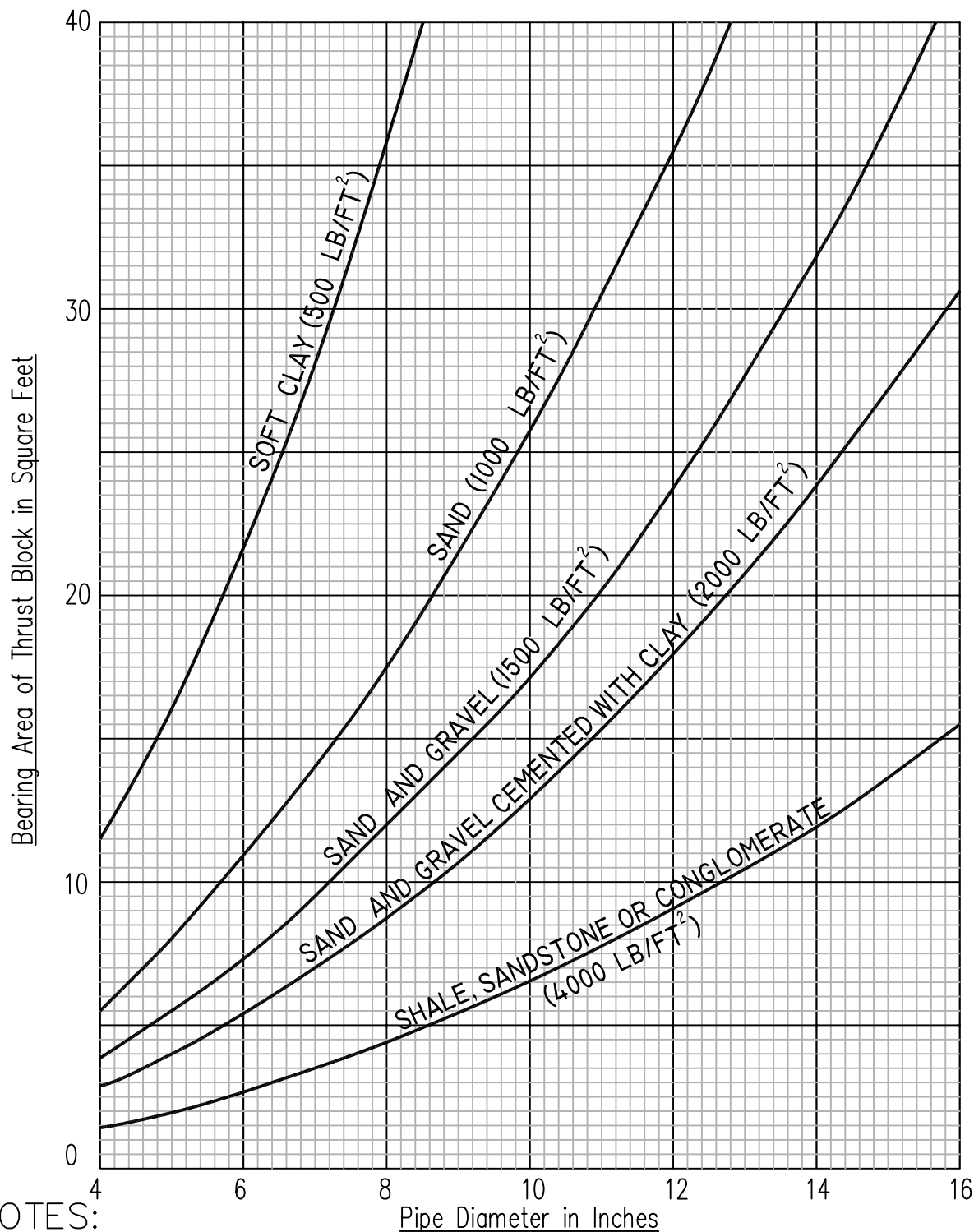
# NOTES:

BEARING AREA SHALL BE THE DIFFERENCE BETWEEN THE BEARING AREAS REQUIRED FOR THRUST ANCHORAGE OF MAINS ON EACH SIDE OF REDUCER AS FOUND FROM STD. DWG. 19 PLUS THE AREA OF THE TRENCH OPENING.

MINIMUM DIMENSIONS SHOWN SHALL BE ADHERED TO.

ITEM	DESCRIPTION	SPEC/DWG
1	POLYETHYLENE WRAP.	
2	CONCRETE THRUST BLOCK (560-C-3250 CONCRETE).	19
3	NO. 4 BAR 9" ON CENTER EACH WAY.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			THRUST ANCHOR FOR WATER MAIN REDUCER - 4 THRU 16 INCH.	6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>WI8</b>



### NOTES:

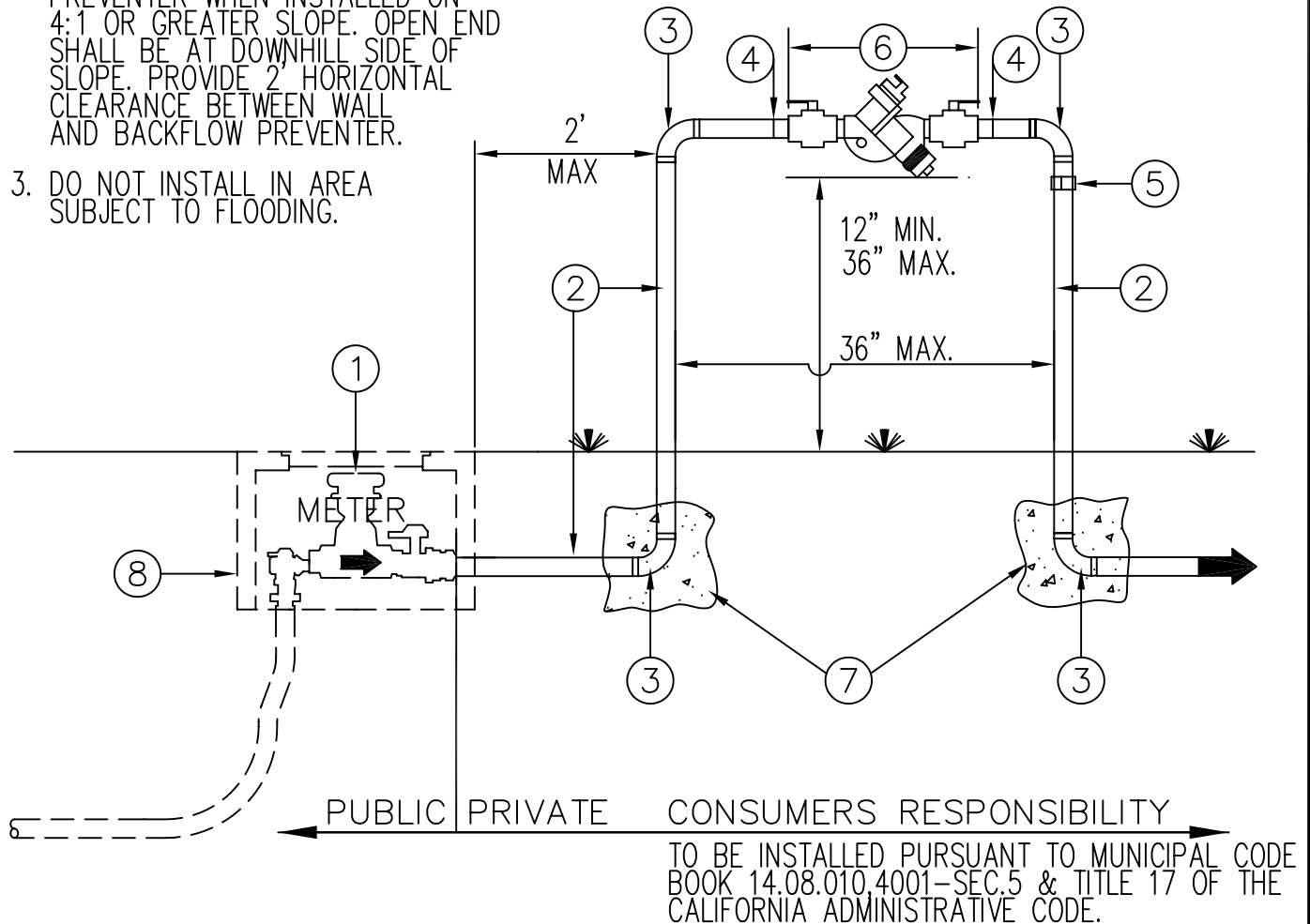
1. BASED ON 225 PSI TEST PRESSURE AND BEARING VALUES OF DRY SOILS.
2. VALUES FROM CURVES ARE FOR TEES AND DEADENDS, I.E. ; STRAIGHT LINE THRUST.  
 FOR 90° BEND: 1.4 VALUE FROM CURVE.  
 FOR 45° BEND: 0.8 VALUE FROM CURVE.  
 FOR 22 1/2° BEND: 0.4 VALUE FROM CURVE.
3. FOR CONDITIONS NOT COVERED BY CURVES, SPECIAL THRUST WALLS, THRUST BLOCKS AND ANCHORS MUST BE CALCULATED AND APPROVED.

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT		6-04
			THRUST BLOCK BEARING AREAS	CITY ENGINEER	DATE
				STANDARD DWG. NO.	WI9

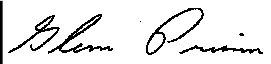


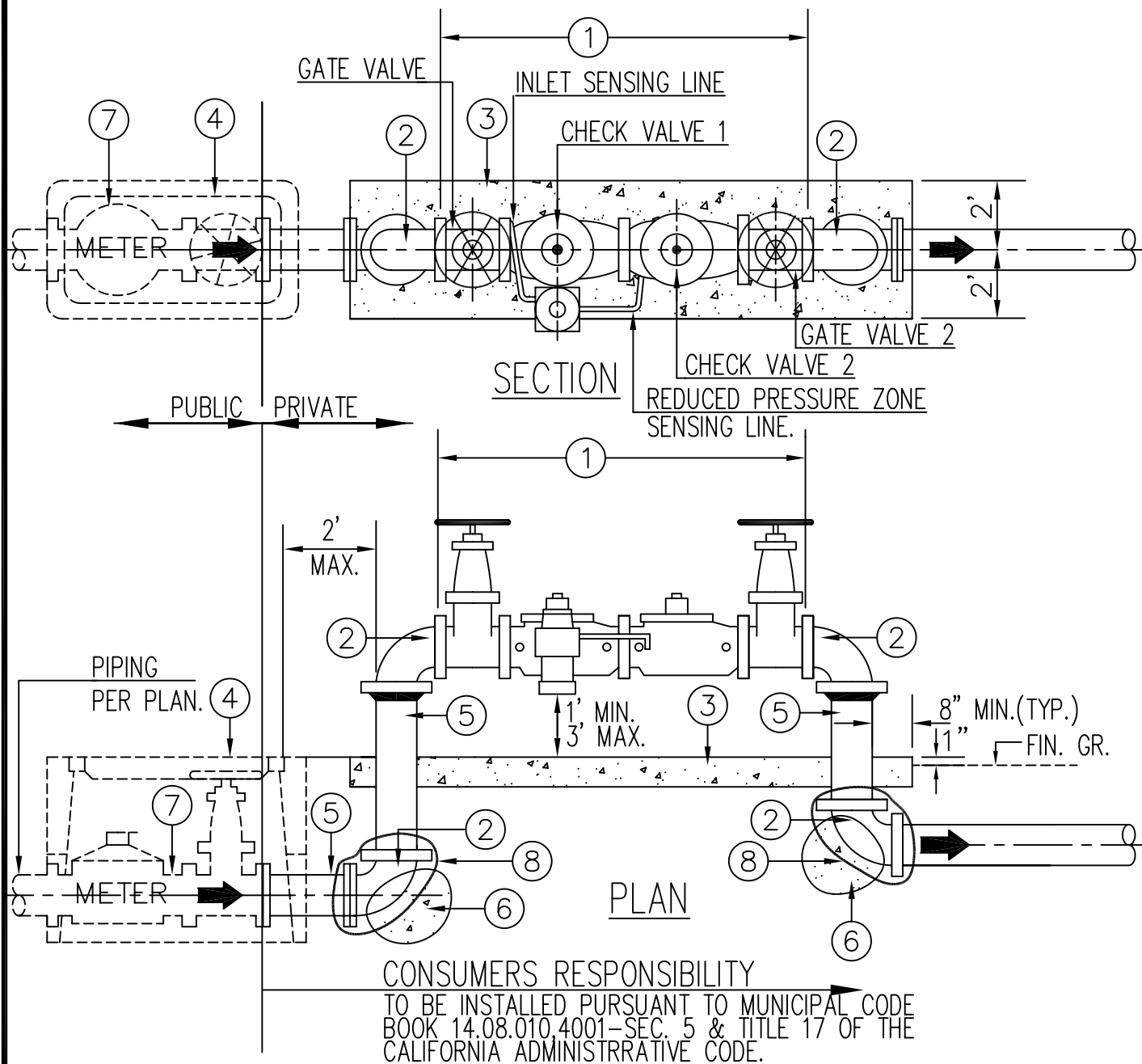
## NOTES:

1. THERE SHALL BE NO FITTINGS OR CONNECTIONS BETWEEN THE METER AND BACKFLOW PREVENTER ASSEMBLY.
2. CONSTRUCT 2' HIGH RETAINING WALL ON 3 SIDES OF BACKFLOW PREVENTER WHEN INSTALLED ON 4:1 OR GREATER SLOPE. OPEN END SHALL BE AT DOWNHILL SIDE OF SLOPE. PROVIDE 2' HORIZONTAL CLEARANCE BETWEEN WALL AND BACKFLOW PREVENTER.
3. DO NOT INSTALL IN AREA SUBJECT TO FLOODING.



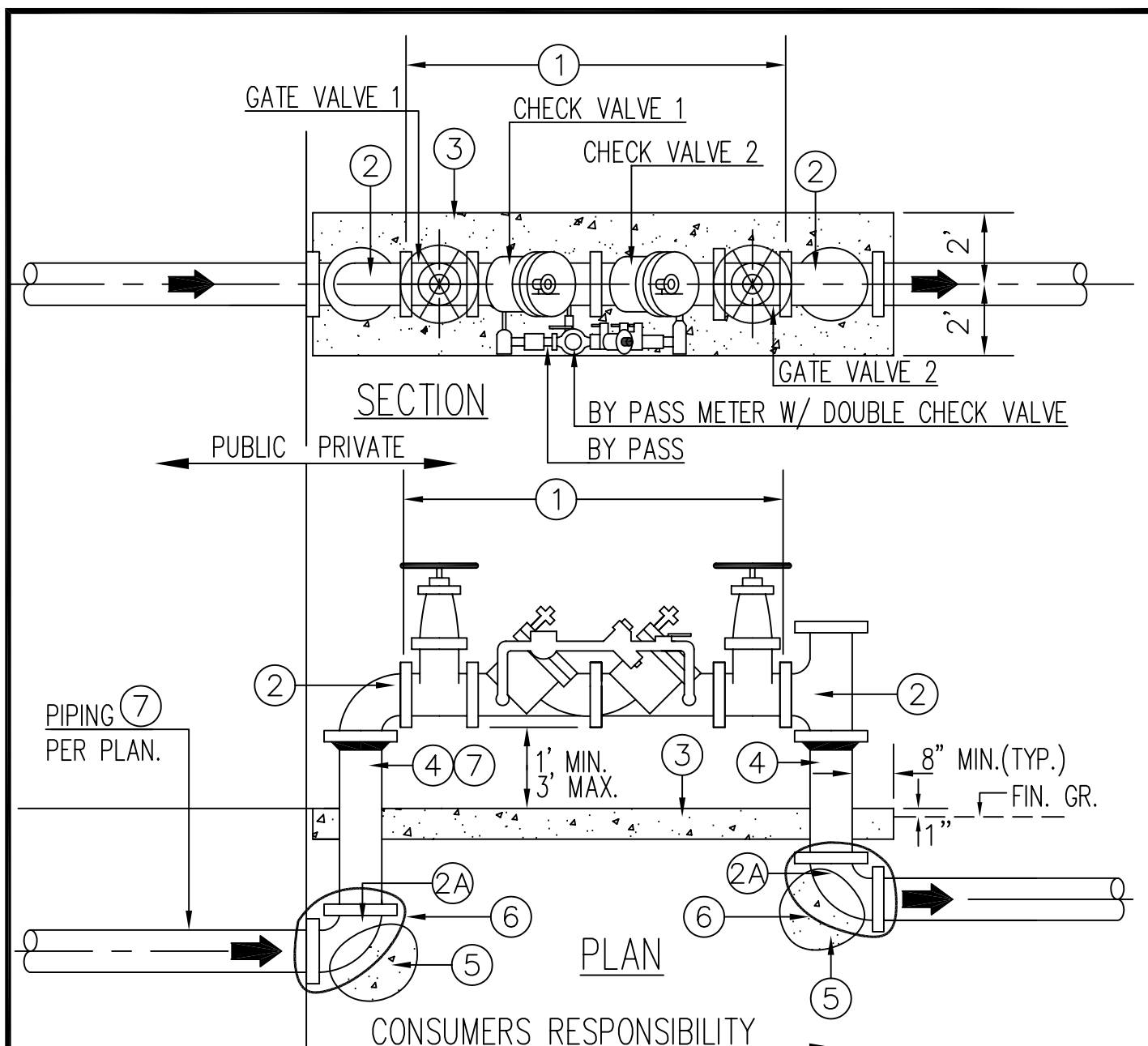
ITEM	DESCRIPTION	SPEC/DWG
1	METER AND VALVE ( BY DISTRICT ).	
2	TYPE K HARD OR TYPE L HARD COPPER OR BRASS RISER.	9
3	COPPER OR BRASS 90° ELBOW ( SOLDER JOINTS OR THREADED FITTINGS ).	
4	COPPER OR BRASS NIPPLE.	
5	BRASS UNION.	
6	APPROVED BACKFLOW PREVENTER ASSEMBLY.	
7	CONCRETE THRUST BLOCK	
8	METER BOX ( BY DISTRICT ).	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			2 INCH AND UNDER BACKFLOW INSTALLATION	 CITY ENGINEER DATE
				STANDARD DWG. NO. <b>W20</b>



ITEM	DESCRIPTION	SPEC/DWG
1	APPROVED CHECK VALVE AND BACKFLOW PREVENTER (RP) ASSEMBLY.	
2	FL. 90° BEND (SIZE X TYPE) PER PLAN.	
3	4 INCH THICK CONCRETE PAD (2000 PSI).	
4	METER BOX (BY DISTRICT).	
5	FL. 10 GA CML&C C-150 STEEL SPOOL WITH S.O.W.O. FLANGE.	
6	THRUST BLOCKING (3250 PSI). 560-C-3250	
7	VALVE AND METER (BY DISTRICT).	
8	POLYETHYLENE WRAP	

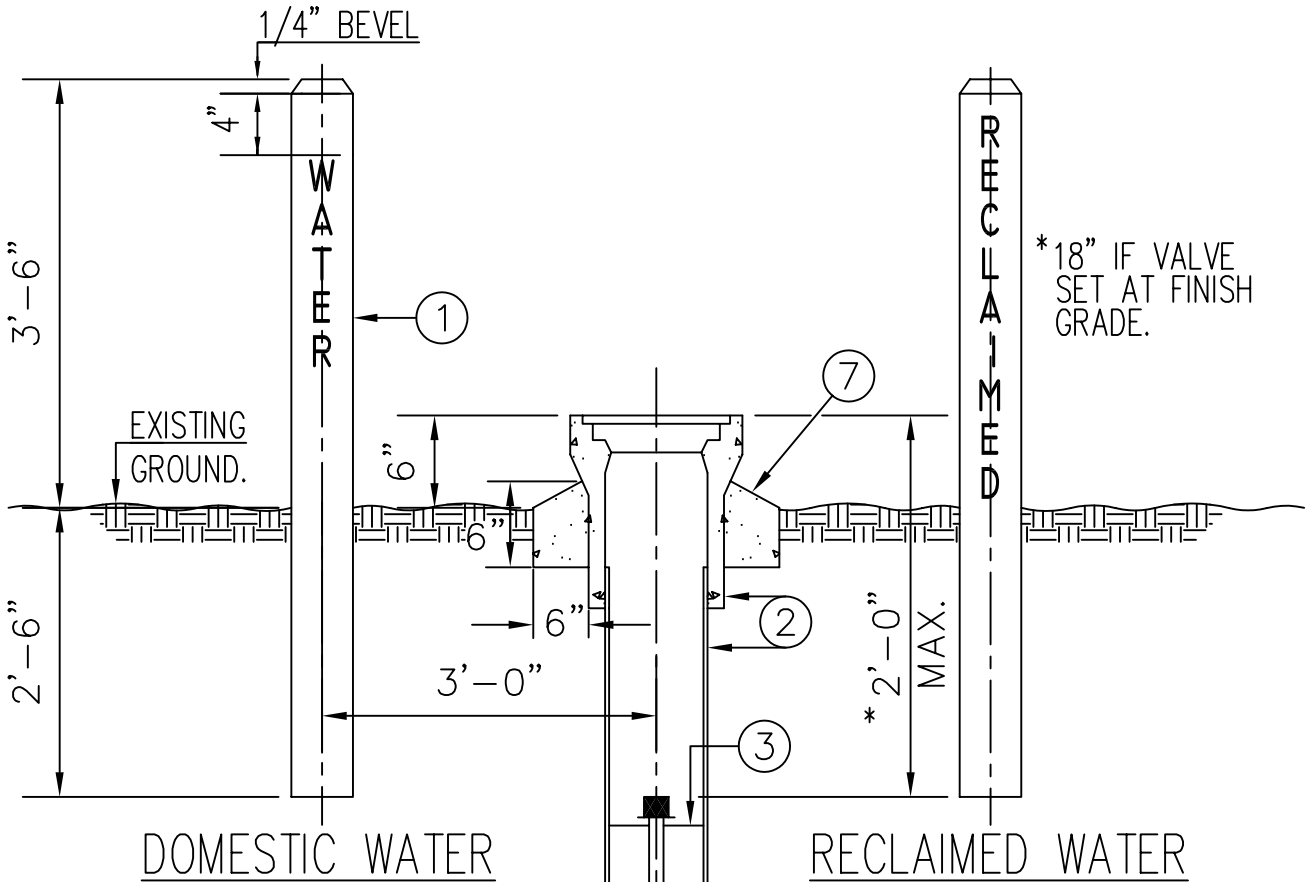
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			3 INCH AND ABOVE BACKFLOW INSTALLATION	<i>Glen P. ...</i> 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>W21</b>



THIS DRAWING SHOWS MINIMUM REQUIREMENTS  
BY CMWD FOR THE DDCV ASSEMBLY. MODIFICATIONS  
MAY BE REQUIRED FOR FIRE MARSHAL'S APPROVAL

ITEM	DESCRIPTION	SPEC/DWG
1	APPROVED DOUBLE CHECK VALVE AND DETECTOR ASSEMBLY.	
2	FL. 90° BEND OR TEE WITH HOSE FITTINGS	
2A	DEPENDING ON THE PIPELINE MATERIAL SHOWN ON PLANS, 90° BEND CAN BE FLXPO OR FLXMI	
3	4 INCH THICK CONCRETE PAD (2000 PSI).	
4	FL. 10 GA CML&C C-150 STEEL SPOOL WITH S.O.W.O. FLANGE.	
5	THRUST BLOCKING (3250 PSI). 560-C-3250	
6	POLYETHYLENE WRAP	
7	6" MINIMUM DIAMETER - REDUCE DIAMETER IN RISER, ABOVE FINISH GRADE WHEN NECESSARY.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glen P... 6-04</i>
			ABOVE GROUND DOUBLE	CITY ENGINEER DATE
			CHECK VALVE DETECTOR ASSEMBLY	STANDARD DWG. NO. <b>W22</b>



# NOTES:

1. ENTIRE MARKER POST SHALL BE PAINTED PRIOR TO INSTALLATION.

FOR DOMESTIC WATER SYSTEM  
PAINT 2 COATS OF WHITE EXTERIOR ENAMEL OVER A PRIME COAT, WITH 2" STENCILLED BLACK LETTERS PAINTED VERTICALLY, STATING 'WATER' ON EACH POST FACE.

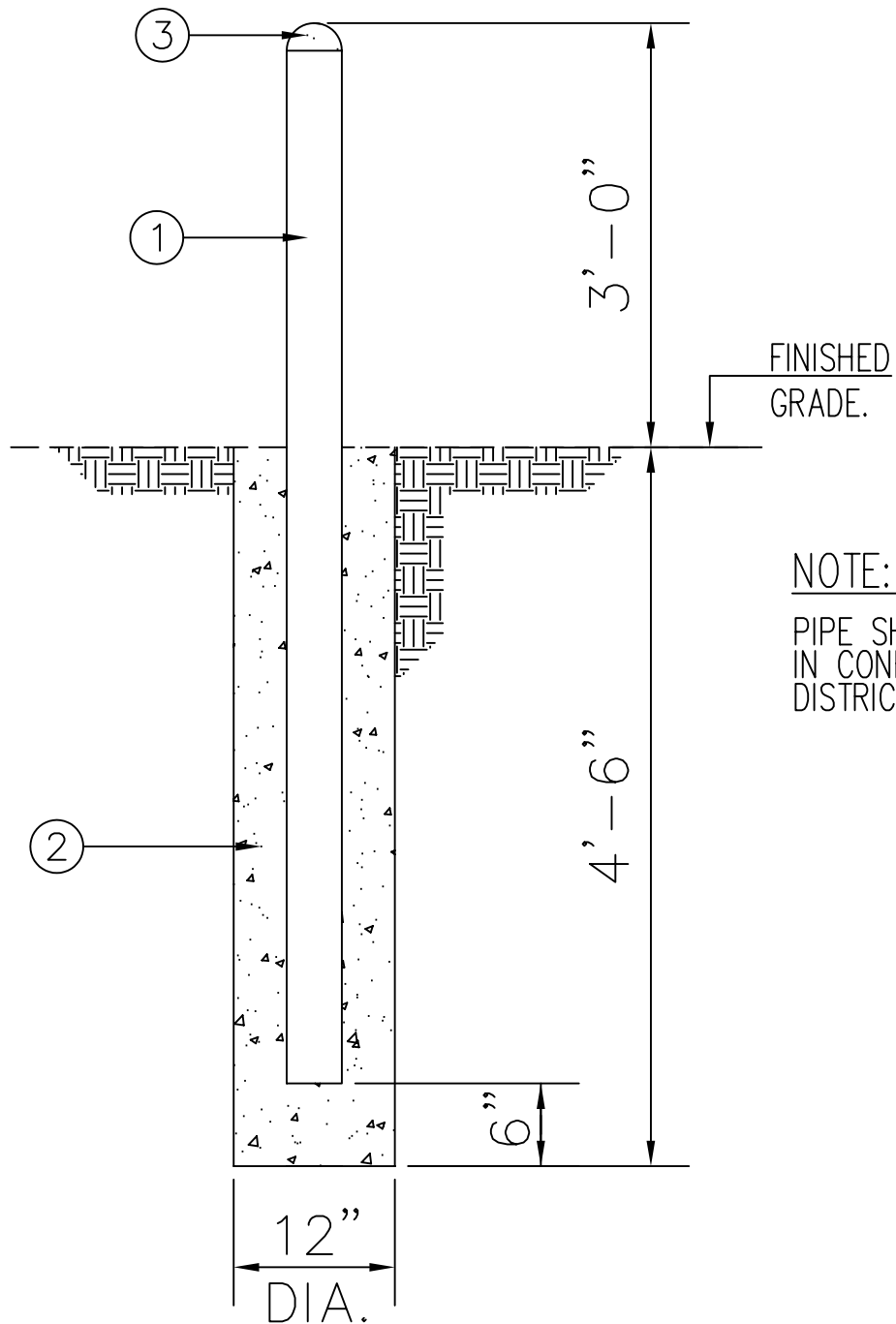
FOR RECLAIMED WATER SYSTEM  
PAINT 2 COATS OF PURPLE EXTERIOR ENAMEL OVER A PRIME COAT, WITH 2" STENCILLED BLACK LETTERS PAINTED VERTICALLY, STATING 'RECLAIMED' ON EACH POST FACE.

2. EXTENSION STEM SHALL BE REQUIRED, WHEN OPERATING NUT IS 5' OR MORE BELOW TOP OF VALVE COVER.

ITEM	DESCRIPTION	SPEC/DWG
1	4X4" REDWOOD OR PRESSURE TREATED DOUGLAS FIR (S4S).	
2	VALVE BOX ASSEMBLY.	
3	DISC GUIDE WELDED TO EXTENSION STEM.	
4	NON-RISING EXTENSION STEM W/ SQUARE WRENCH NUT. (COUPLE PER MANU. SPECS.)	
5	GATE VALVE.	
6	POLYETHYLENE WRAP.	
7	CONCRETE ANCHOR COLLAR IF LOCATED IN UNPAVED SURFACE	

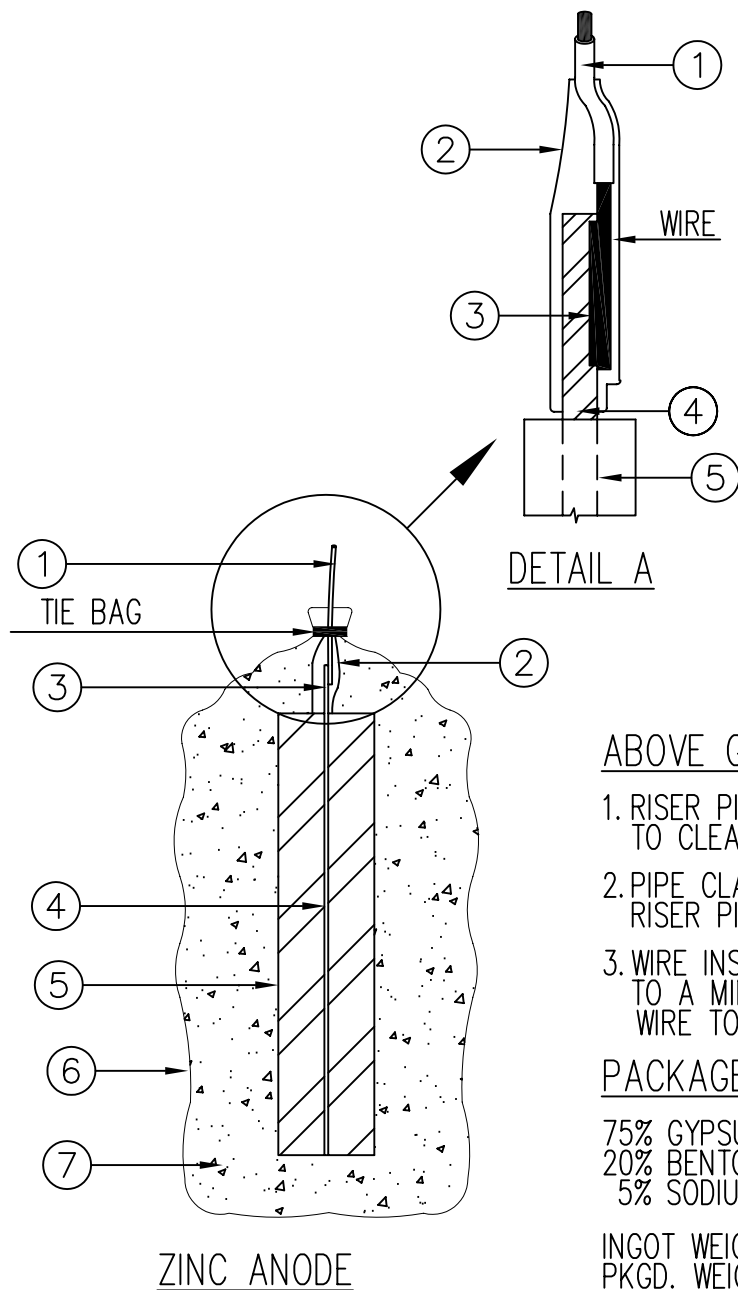
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	6-04
			EXTENSION STEM AND MARKER POST	

*Glenn P. ...* 6-04  
CITY ENGINEER DATE  
STANDARD DWG. NO. **W23**



ITEM	DESCRIPTION	SPEC/DWG
1	4" STEEL PIPE. GALVANIZED / PAINTED	
2	470-C-2000 CONCRETE FOOTING.	
3	FILL PIPE WITH 470-C-2000 CONCRETE ( ROUND OFF TOP ).	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Pearson</i> 6-04
			PROTECTION POST	CITY ENGINEER DATE
				STANDARD DWG. NO. W24



#### ABOVE GRADE CONNECTION NOTES:

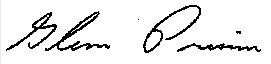
1. RISER PIPE SHALL BE WIRE BRUSHED TO CLEAN BRIGHT METAL.
2. PIPE CLAMP SHALL BE LOCATED ON RISER PIPE.
3. WIRE INSULATION SHALL BE STRIPPED TO A MINIMUM LENGTH TO CONNECT WIRE TO PIPE CLAMP.

#### PACKAGED BACKFILL COMPOSITION:

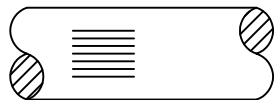
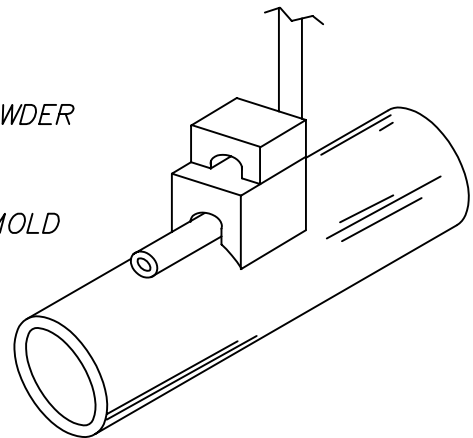
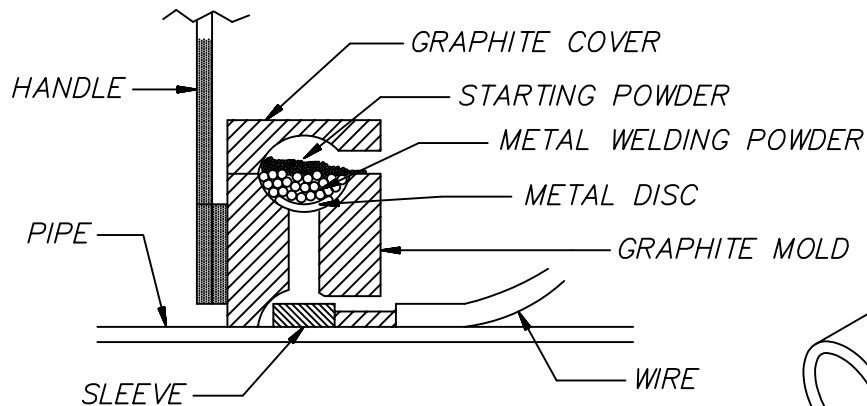
75% GYPSUM  
20% BENTONITE  
5% SODIUM SULFATE

INGOT WEIGHT: 30 LBS.  
PKGD. WEIGHT: 70 LBS. APPROX.

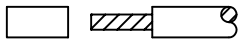
ITEM	DESCRIPTION	SPEC/DWG
1	ANODE LEAD NO.12 AWG STRD. COPPER WIRE W/ THW INSULATION.	
2	HEAT SHRINKABLE SLEEVE.	
3	SILVER SOLDER CONNECTION.	
4	1/4" DIAMETER GALVANIZED STEEL CORE.	
5	2"X2"X30" ZINC ALLOY INGOT.	
6	CLOTH BAG.	
7	PACKAGED BACKFILL.	
8	BRASS OR COPPER RISER PIPE.	
9	BRASS OR COPPER PIPE CLAMP WITH SCREW TERMINAL.	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			ZINC ANODE AND CONNECTORS FOR 1" AND 2" WATER SERVICE	 6-04 CITY ENGINEER DATE STANDARD DWG. NO. <b>W25</b>

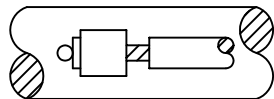




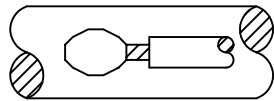
STEP 1. FILE STRUCTURE CONNECTION AREA (3 IN x 3 IN) TO BARE SHINY METAL AND CLEAN.



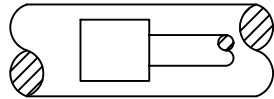
STEP 2. STRIP INSULATION FROM WIRE. ATTACH SLEEVE WHERE REQUIRED BY MANUFACTURER.



STEP 3. HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR AND IGNITE WITH FLINT GUN.



STEP 4. REMOVE SLAG FROM CONNECTION AND PEEN WELD FOR SOUNDNESS.



STEP 5. COVER CONNECTION AND EXPOSED STRUCTURE SURFACE WITH A BITUMINOUS COATING COMPOUND. PLACE PLASTIC SHIELD CAP FIRMLY OVER CONNECTION.

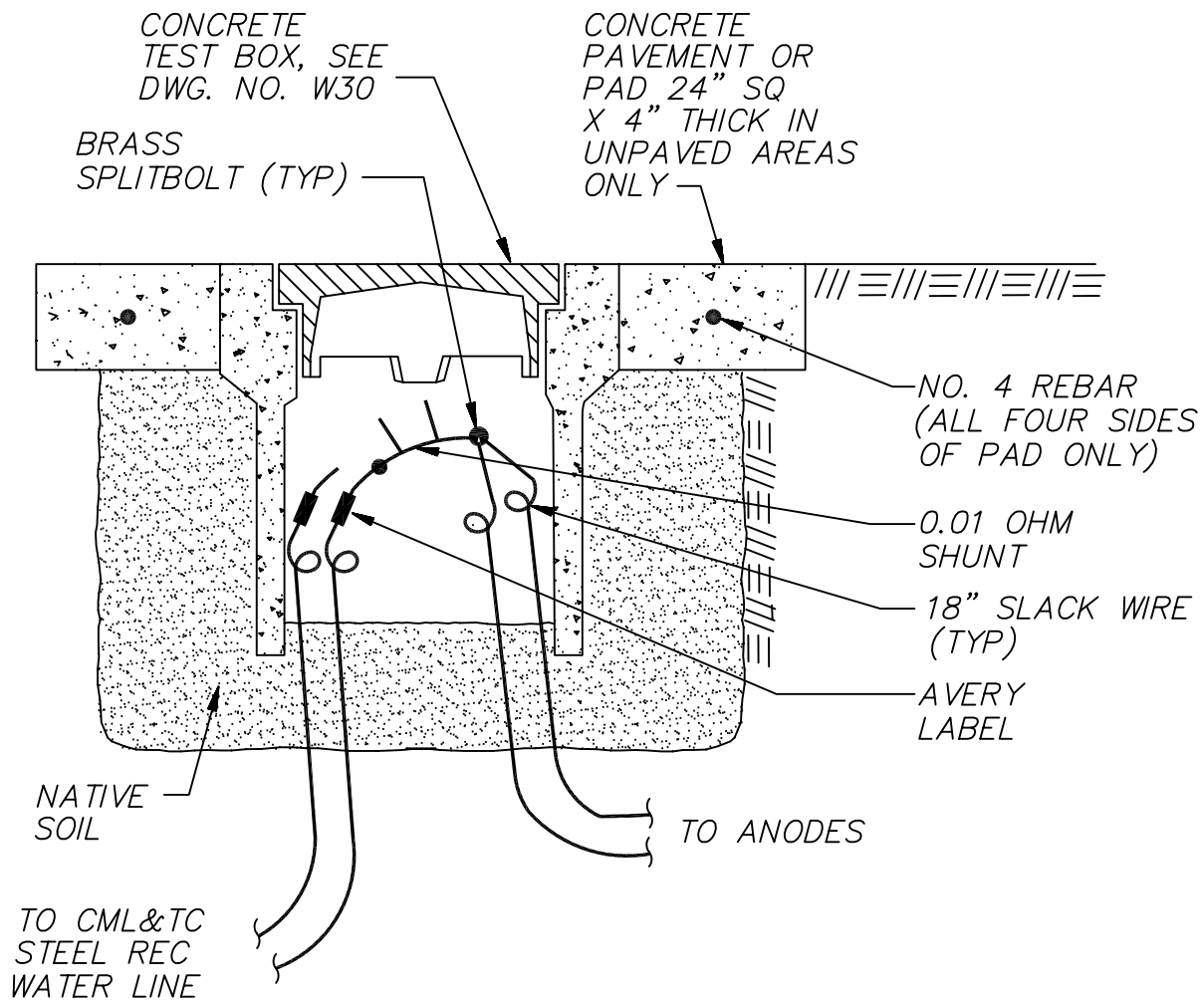
NOTES:

1. ALL WIRE WELDS SHALL BE MINIMUM 3 INCHES APART.
2. STANDARD WELD CARTRIDGES SHALL BE USED FOR STEEL SURFACES,

NO SCALE

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	
			EXOTHERMIC WELD PROCESS	<i>Glenn P. P. P.</i> 6-04
				CITY ENGINEER DATE
				STANDARD DWG. NO. W27





WIRE I.D. LEGEND

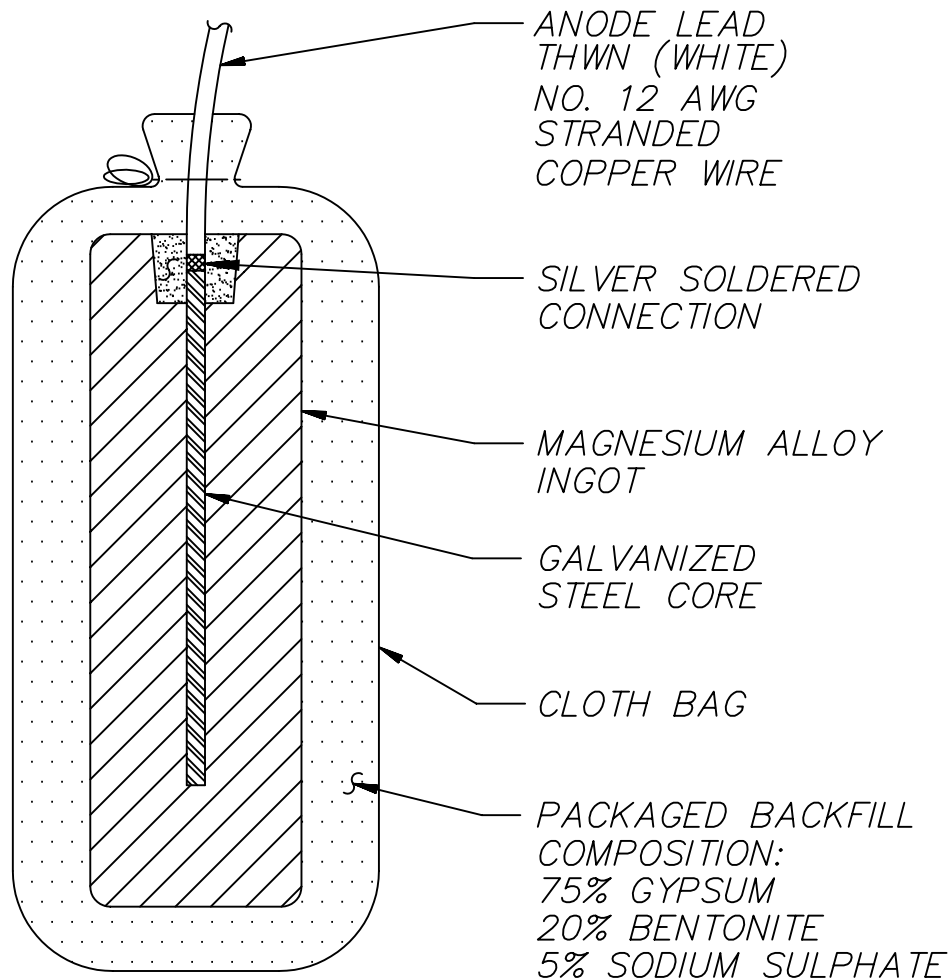
<u>WIRE</u>	<u>SIZE</u>	<u>LABEL IDENTIFICATION</u>
A&B	2 - NO 8 HMWPE	STL/CML&TC RW

NOTES:

1. NO WIRE OR CABLE SPLICES ARE PERMITTED EXCEPT AS INDICATED IN THE DRAWINGS OR AS SPECIFICALLY APPROVED BY THE ENGINEER.
2. WIRES SHALL BE TAGGED USING MINIMUM 10 PT. FONT AND CONTAIN:  
PIPELINE MATERIAL & SIZE  
DATE INSTALLED  
PIPELINE STATION NO.
3. PROVIDE 18" SLACK WIRE AT WELD TO PIPE AND COILED IN TEST BOX.

NO SCALE

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glen P. ...</i> 6-04
			2-WIRE TEST STATION WITH ANODES	CITY ENGINEER DATE
			WIRING DIAGRAM	STANDARD DWG. NO. <b>W28</b>



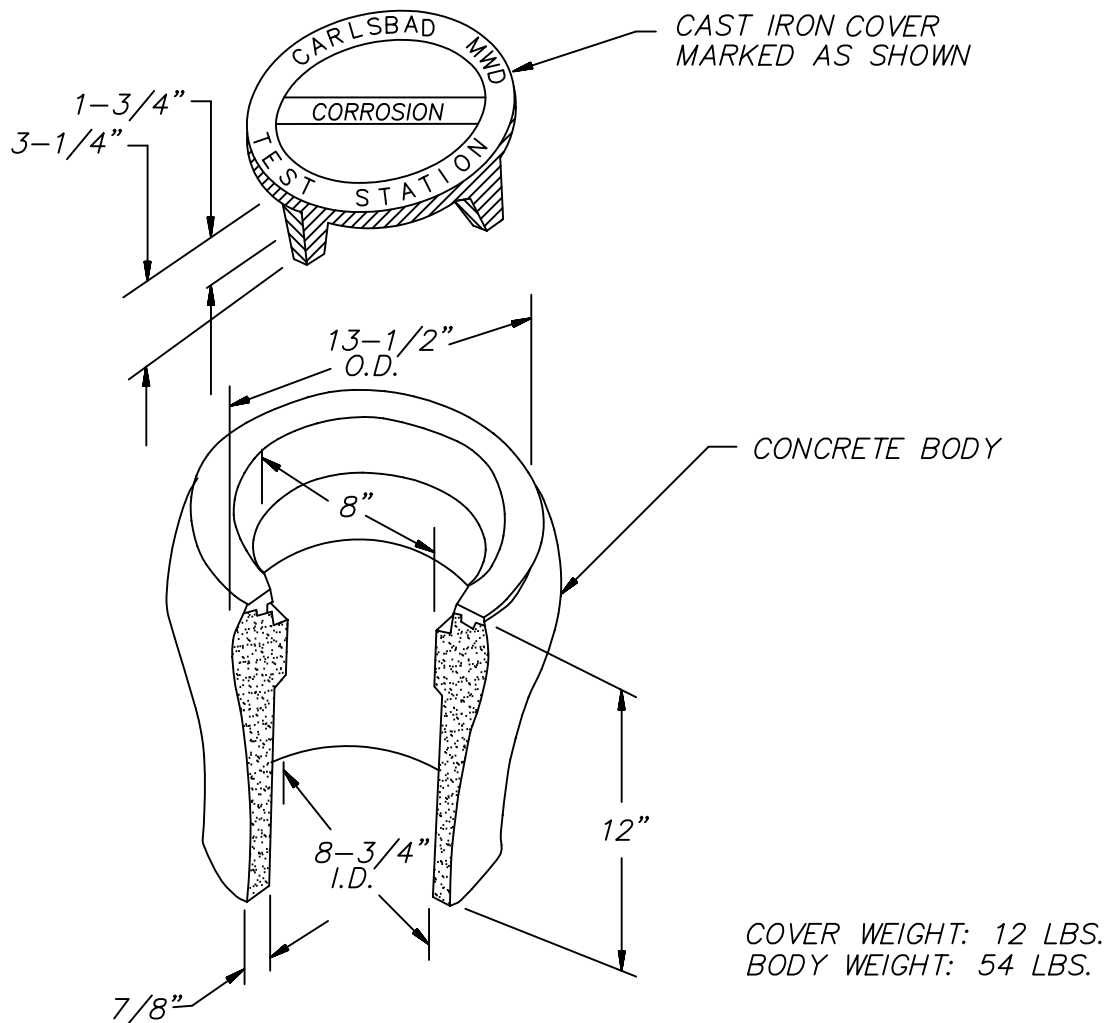
MAGNESIUM INGOT  
 DIMENSIONS:  
 5" X 6" X 32" LONG  
 INGOT WEIGHT: 48 LBS.  
 PKGD WEIGHT: 105 LBS.  
 (APPROX.)

CHEMICAL COMPOSITION  
(HIGH POTENTIAL)

<u>ELEMENT</u>	<u>CONTENT %</u>
Aluminum	0.010
Manganese	0.50 TO 1.30
Copper	0.02 MAX
Nickle	0.001 MAX
Iron	0.03 MAX
Other	0.05 MAX
Magnesium	BALANCE

NO SCALE

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn P. ...</i>	6-04
			MAGNESIUM ANODE	CITY ENGINEER	DATE
				STANDARD DWG. NO.	W29



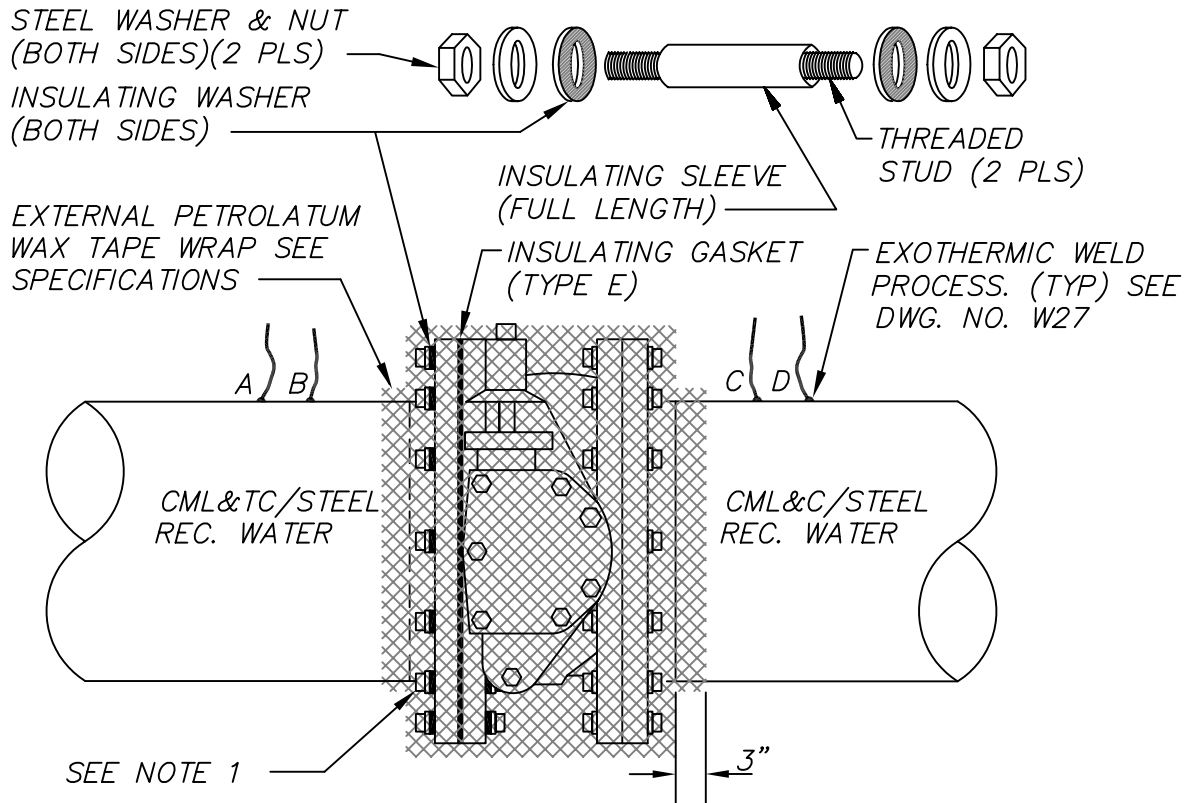
**NOTES:**

1. ALL AT GRADE TEST STATIONS SHALL BE THE CIRCULAR, CONCRETE, AT-GRADE TYPE WITH A METAL LID.
  - A. BOTTOM OF TEST BOX SHALL BE NATIVE SOIL.
  - B. A REINFORCED CONCRETE PAD (24" SQUARE X 4" THICK) IS REQUIRED AROUND TEST BOXES LOCATED IN UNPAVED AREAS.
  - C. PLACE TEST BOX BEHIND SIDEWALK WITH APPROVAL OF CITY OF CARLSBAD. DO NOT PLACE IN STREET OR MEDIAN.

NO SCALE

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Pearson</i> 6-04
			CONCRETE TEST BOX	CITY ENGINEER DATE
				STANDARD DWG. NO. W30


INSULATING MATERIALS:  
 GASKET - TYPE "E" G10 GLASS  
 W/ RECT. O-RING  
 SLEEVE - G10 GLASS  
 WASHER - G10 GLASS

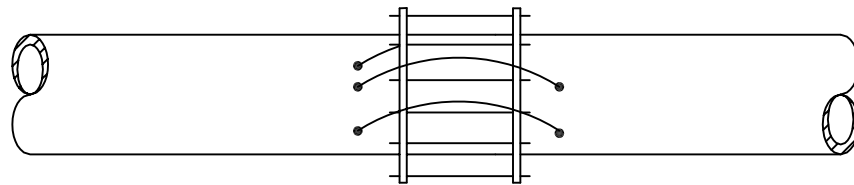


NOTES:

1. FULL LENGTH INSULATING SLEEVES REQUIRED AT ALL THRU-FLANGE BOLTS OR STUDS. HALF LENGTH SLEEVES REQUIRED AT THREADED BOLT HOLES AT VALVE BONNET AND BASE.
2. INSTALL TEST BOX BEHIND CURB SIMILAR TO DETAIL 1 ON THIS SHEET.

NO SCALE

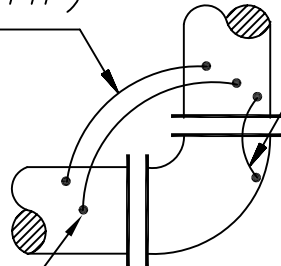
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	 6-04
			BURIED INSULATING FLANGE	CITY ENGINEER
				DATE
				STANDARD DWG. NO. W31



FLEXIBLE COUPLING

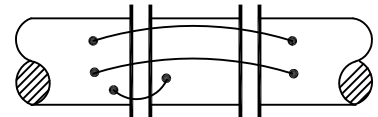
2-BOND WIRES-AWG NO. 2  
STRD. COPPER WIRE (TYP)  
WITH HMWPE INSUL.

1-NO 6 AWG HMWPE  
(TYP) SEE NOTE 4

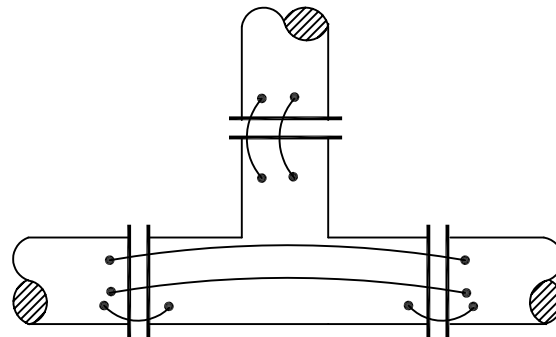


BEND

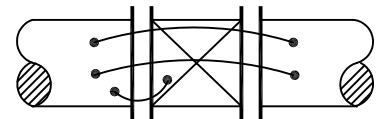
EXOTHERMIC WELD  
(TYP) SEE DWG. NO. W27



SPOOL



TEE



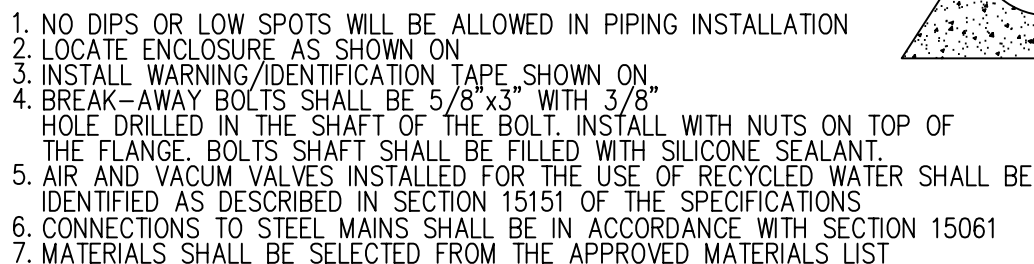
VALVE


NOTES:

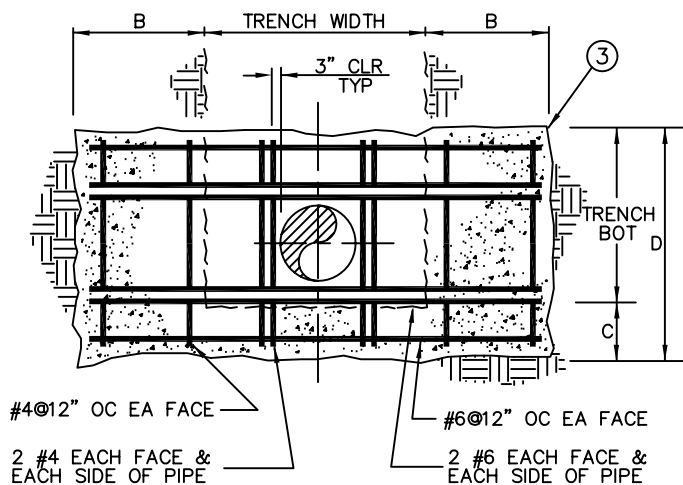
1. ALL WIRE WELDS SHALL BE 3" APART MIN.
2. ALL BOND WIRES SHALL BE INSTALLED AT MINIMUM LENGTHS.
3. BOND WIRES SHALL NOT BE INSTALLED ACCROSS INSULATING JOINTS.
4. BOND WIRE SIZE SHALL BE AWG NO 2. TWO ARE REQUIRED.  
ONE NO. 6 AWG HMWPE IS REQUIRED FROM PIPE TO VALVE BODY,  
SPOOL, COUPLING, AND TEE.

NO SCALE

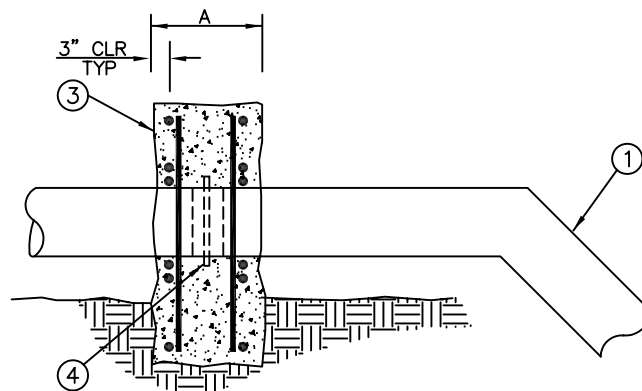
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	<i>Glenn Pearson</i>	6-04
			MECHANICAL JOINT BOND	CITY ENGINEER	DATE
				STANDARD DWG. NO.	W32



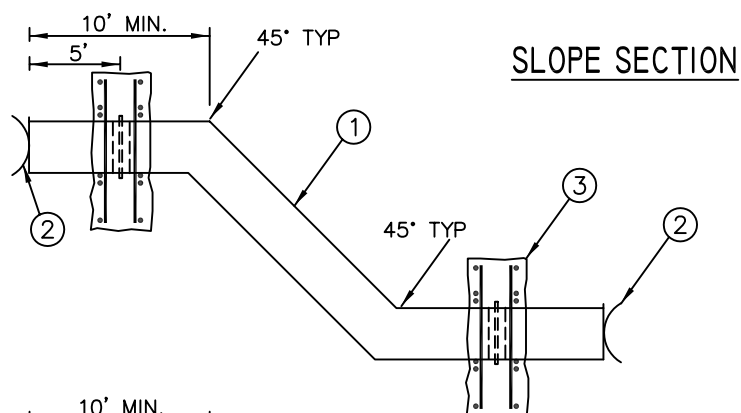
REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT		6-04
			4" AUTOMATIC COMBINATION AIR RELEASE	CITY ENGINEER	DATE
			& AIR/VACUUM VALVE INSTALLATIONS	STANDARD DWG. NO.	W33



**ANCHOR BLOCK SECTION**

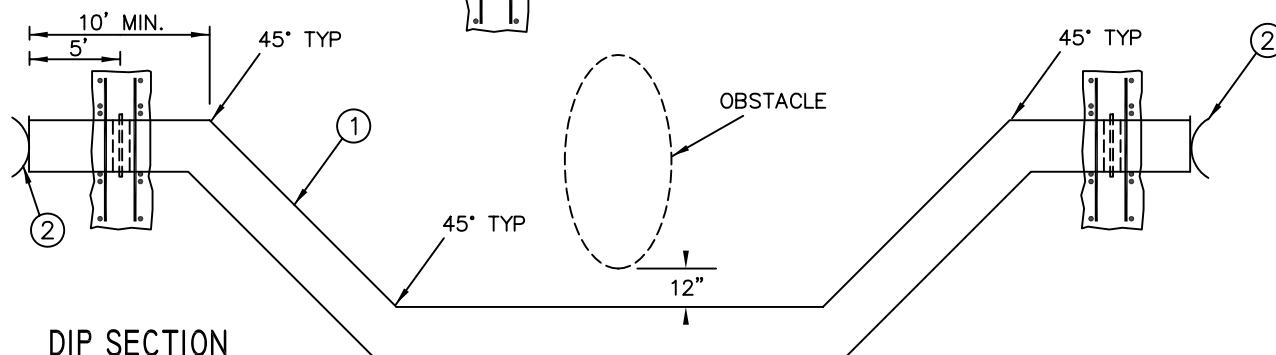


**ANCHOR BLOCK ELEVATION**



**SLOPE SECTION**

PIPE SIZE	A	B	C	D
4"	ALL DIMENSIONS			
6"	CALCULATED			
8"	BY ENGINEER			
10"	AND SUBMITTED			
12"	FOR APPROVAL			



**DIP SECTION**

ITEM	DESCRIPTION	SPEC/DWG
1	STEEL PIPE, CML&C, WELDED JOINTS	
2	FLANGE X PUSH JOINT ADAPTOR	
3	CONCRETE ANCHOR BLOCK WITH REINFORCING STEEL	
4	1" THICK X 3" HIGH WELD STL RING	

REV.	APPROVED	DATE	CARLSBAD MUNICIPAL WATER DISTRICT	6-04
			WELDED STEEL PIPE SECTION WITH THRUST WALLS FOR SLOPES AND DIPS	CITY ENGINEER
				DATE
				STANDARD DWG. NO. <b>W34</b>